DOCUMENT RESUME

ED 330 893 CE 057 772

TITLE A Model System for the Design and Maintenance of Related Instruction Curriculum for Approved U.S. Department of Labor Apprenticeship Programs; Phase III. Final Report and Final Evaluation Report.
INSTITUTION Lane Community Coll., Eugene, Oreg.
SPONS AGENCY Fund for the Improvement of Postsecondary Education (ED), Washington, DC.
PUB DATE Sep 89
CONTRACT G008642193
NOTE 72p.
PUB TYPE Reports - Evaluative/Feasibility (142)

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS *Apprenticeships; *Clearinghouses; Computers; *Curriculum Development; Database Design; *Databases; Information Retrieval; *Instructional Materials; Models; *National Programs; Postsecondary Education; Program Evaluation; Vocational Education

ABSTRACT

A final report and final evaluation report of Phase III are provided for a project to establish a national clearinghouse for apprenticeship-related instructional materials. The final report provides a summary and a narrative account of these project activities: identification of materials; identification of apprenticeship curriculum needs; establishment of models for design and development of materials; and establishment of a computerized system for storing, organizing, and retrieving curriculum materials from a centralized database and repository for printed materials. The evaluation report focuses on the continuing evaluation of the directory and materials dissemination. The following findings are reported: (1) the measures used indicated a high degree of acceptance for the utility of the directory; (2) mailing lists of potential users were developed; (3) clearinghouse brochures were made available; (4) apprenticeship instructor workshops on use of the clearinghouse were conducted; and (5) a continuously updated computerized database was established in the UNIX system. Twelve appendices making up the bulk of the document include a listing of databases used; a description of record fields for the apprenticeship database; and memoranda on the following items: directory of company information, field labels for two databases, vendor database on the FIPSE (Fund for the Improvement of Postsecondary Education) computer, vendor directory (including names, addresses, and descriptions of 212 vendors), Vocational Education Curriculum Materials subfile, Resources in Vocational Education subfile, National Technical Information Service subfile, and a projected apprenticeship clearinghouse. Two programming sheets conclude the document. (YLB)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED330893

A MODEL SYSTEM FOR THE DESIGN AND MAINTENANCE OF RELATED INSTRUCTION CURRICULA FOR APPROVED U.S. DEPARTMENT OF LABOR APPRENTICESHIP PROGRAMS

PHASE III

COVER SHEET

FINAL REPORT AND FINAL EVALUATION REPORT

Grantee Organization: Lane Community College
4000 East 30th Avenue
Eugene, OR 97405

Grant No.: G008642193

Project Dates: Starting Date: October 1, 1986
Ending Date: September 30, 1989

Project Director: Carl Horstrup
Apprenticeship Coordinator
Lane Community College
4000 East 30th Avenue
Eugene, OR 97405
Telephone: (503) 747-4501, ext. 2843

FIPSE Program Officer:

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

BEST COPY AVAILABLE

CE 057 772

This project established a national clearinghouse for apprenticeship related instructional materials. This project searched out quality training materials from all states and Canadian provinces. During this search process, an assessment of apprenticeship curriculum needs was made and curriculum gaps defined. A directory was produced and distributed to all 10 USDL BAT Regional and 50 State Offices and to several states' vocational curriculum centers. Continual progress reports were printed in the monthly national newsletter, USAA (United States Apprenticeship Association) Sentinel, which has membership in every state and U.S. territory. A computerized data base system was developed allowing additions and revisions as various sources become available for inclusion.

Carl Horstrup
Apprenticeship Coordinator
Lane Community College
4000 East 30th Avenue
Eugene, OR 97405
(503) 747-4501, ext. 2843

"A MODEL SYSTEM FOR THE DESIGN AND MAINTENANCE OF RELATED INSTRUCTION CURRICULA FOR APPROVED U.S. DEPARTMENT OF LABOR APPRENTICESHIP PROGRAMS"

Project Title: A Model System for the Design and Maintenance of Related Instruction Curricula for Approved U.S. Department of Labor Apprenticeship Programs

Grantee Organization: Lane Community College
4000 East 30th Avenue
Eugene, OR 97405

Project Director: Carl Horstrup
Apprenticeship Coordinator
(503) 747-4501, ext. 2843

A. Project Overview

As a result of the clearinghouse activities and the models for design of materials, a planned approach to curriculum development emerged. Individual states will no longer develop materials that already exist in other states. Curriculum design and development were targeted toward the unmet needs of apprenticeship. The cooperating states became involved in joint planning and development of materials for shared use.

B. Purpose

Apprenticeship related training is scattered throughout hundreds of post-secondary institutions, trade associations, labor councils and private companies. Many good curriculum materials have been developed for apprentice related instruction. This proposal sought to identify those materials that have been developed; identify areas where additional materials are needed; establish models for design and development of materials; and establish a computerized system for storing, organizing and retrieving curriculum materials from a centralized data base and repository for printed materials.

C. Background & Origins

If apprenticeship related training is to remain a viable approach to the education of our work force, all apprenticeable trades must be served by the program. The low enrollment trades have been denied such training because it has never been cost effective for community colleges to deliver to small numbers of students. The clearinghouse will do much toward resolving the low enrollment problems as an extensive resource bank of individualized modules are now available through it.

D. Project Descriptions

As materials become readily available for review in the field, users will find a greater need for updating old materials. Many good materials were developed in the 1970's but have become out-of-date. These materials can now be rapidly updated to the recent technological changes. Unfortunately, most curriculum has been developed with grant funds. After the funding stops, there is little incentive for updating the materials. Hopefully, the clearinghouse concept will

create a greater awareness of the national investment in curriculum development and develop a demand for updating. Updating is highly cost-effective when compared to new curriculum development.

E. Project Results

1. Produced the directory which was distributed to all 10 USDL BAT Regional and 50 State Offices.

2. USDL BAT through its "Apprenticeship 2000 Phase II" recently awarded three grants and two contracts in support of this endeavor. These demonstration projects will be concluded within two years. One specific award to FU Associates deals with National Registration. This project will involve study and development of recommendations regarding a national on-line apprenticeship system and a "scientific" system for determining the apprentice-ability of an occupation. Our directory and data base will serve as the base to determine the availability of occupational related training curricula.

3. Vocational Curriculum Centers from Alaska, Republic of Palau, Arkansas, California, Colorado, Hawaii, Idaho, Illinois, Iowa, Kansas, Maine, Mississippi, Minnesota, Missouri, Nebraska, New Jersey, New Mexico, North Dakota, Oklahoma, Oregon, Pennsylvania, Washington, and Washington, D.C. were presented copies of the directory at the recent Third Annual Conference for Library and Resource Center Staff in Portland, Oregon.

4. Continual progress reports were printed in the monthly national newsletter USAA (United States Apprenticeship Association) Sentinel which has membership in every state and U.S. territory. USAA is an organization dedicated exclusively to the protection and betterment of apprenticeship.

5. A computerized data base system was developed that allows additions and revisions as various sources become available for inclusion.

F. Summary and Conclusions

Evaluation reports submitted throughout the duration of this project by the third party evaluator, Mr. E. Wayne Courtney, continually indicated satisfactory completion within the overall objectives in accordance with the conditions of the grant. Copies of these evaluations are on file with USDE, FIPSE Office in Washington, D.C.

APPENDICES

1. a. What forms of assistance from FIPSE were helpful to you?--All project coordinators were always cordial and helpful, regardless of the type of our concerns.

   b. How can FIPSE more effectively work with projects?--Procedures to reallocate funds within the approved budget need to be streamlined.

2. a. What should the FIPSE staff consider in reviewing future proposals in your

area of interest?--Provide accurate information of upcoming RFP's during FIPSE Project Directors' meetings, rather than make pacifying statements, seemingly to justify the attendance of the session speakers.

b. What are emerging new directions?--Need for development of curriculum and test training sessions for (1) hazardous waste removal and (2) drug, alcohol, AIDs, etc. for all apprenticeship and journeyman programs.

c. What are key considerations, given your type of project?--Continual issuance of future awards to projects which develop linkage projects of areas of lesser numbers.

Body of Final Report

Apprenticeship programs are an essential ingredient in the American industrial system. Without trained electronics technicians, aircraft mechanics, manufacturing plant electricians, boiler operators, utility linemen, pipefitters, millwrights, laboratory technicians, or any of the other more than 700 apprenticeable occupations, new and existing businesses would find it difficult to operate efficiently and competitively.

Apprenticeship programs combine daily on-the-job training with instruction in technical subjects so that apprentices are exposed to all the required skills and knowledge necessary for their chosen trades. Apprentices learn the practical aspects on the job by being assigned to all phases of their respective occupations. Theoretical aspects are mastered during related classroom training, providing an opportunity for the apprentice to consider, in depth, the underlying principles governing various job activities, thereby enhancing the individual's life-long employability and guaranteeing more competent workers for industry.

Federal regulations mandate that all registered apprentices receive at least 144 hours per year of related classroom training. This training includes technical knowledge, auxiliary information and occasional manipulative skills. For example, subject matter includes trade math, blueprint reading, tool identification, human relations, safety and communications.

This project established a national clearinghouse for apprenticeship related instructional materials. This project searched out quality training materials from all states and Canadian provinces. During this search process, an assessment of apprenticeship curriculum needs was made and curriculum gaps defined.

Outcomes include increased availability of quality materials, expanded apprenticeship training, cost-effective materials, up-to-date materials, time savings for curriculum planners and a partial solution to the low enrollment problem in apprenticeship. The project was organized into three phases--development, field test, and dissemination. A third party evaluator evaluated the processes, products and impact of this project during the three-year time frame. Evaluation findings were utilized to make on-going modifications in the project plan.

This project utilized approved research techniques for identifying apprenticeship related instructional materials in current use. The project coordinator conducted national searches on the BRS computerized system and other systems. The results of national searches were cross-referenced to assure that all data bases have been sampled.

Our data base records have been registered into the UNIX system. The restructuring of the downloaded records precludes duplication into any copyright databases. A total of 2,647 records have been read into the program for purposes of initial use. Abstracts will not be loaded because of potential copyright problems. Records have been utilized from the following sources:

National Technical Information Service (NTIS)--341 records
Vocational Education Curriculum Materials (VECM)--745 records
Research in Vocational Education (RIVE)--543 records
ERIC--1,008 records

The project has purposely avoided the Ontario Education Reports (ONED), AV Online Multimedia, and NICEM documents because of the copyright matter (see Appendix for original list of databases). The policy of the project staff is to avoid confrontation with the copyright issue.

As the documentation of the vendors was completed, the database could be searched by specific topics in the materials type (MT) field by company name, location, area code, etc. The input form contains a basic information capability with the addition of a FAX number, with the telephone number being split into two fields, listing toll and toll-free status. The finished project contains at least three sections listing the resource by material type, vendor type, and by geographical location.

State Departments of Education, state and national apprenticeship organizations, trade unions and private industry were contacted about material being utilized in training apprentices. These contacts identified the materials being used and itemized their shortfalls in training materials. The results of the field research served to identify "what exists" and "what should be" in apprenticeship related training materials. Once the field needs were clearly identified, the project utilized a task inventory process with local apprenticeship committees to identify specific content needed in selected curriculum areas.

Post secondary educational programs and courses require a minimum number of enrollees, usually ten to sixteen, to create a class. Frequently, the number of apprentices who require instruction in a particular class in a given geographic area will be too small to create a formal class. Low enrollment has been identified as one of the two most critical problems in the delivery of apprenticeship related classroom training in post-secondary institutions.

The low enrollment problem can only be met through individualized instructional programs. Individualized materials allow one instructor to work with class-sized groups made up of apprentices from several trades areas. In practice, individualization refers to services that can be rendered to small companies rather than to single individuals. A wide variety of self-paced instructional modules were made available for "tailor-making" programs for apprentices in low enrollment trades. Many good materials have been developed in the United States and Canada to enhance individualized instruction. There is now an information clearinghouse for obtaining materials in a timely manner.

Each state has developed materials according to its own priorities in apprenticeship. This use to result in duplications of efforts in some trades and a total lack of available curriculum in other occupations. A computerized data base, specific to apprenticeship, was needed to allow instant access to all available materials. The newly developed data base and materials repository allow post-secondary institutions to select and order materials with minimum time and effort spent.

Availability of Materials

Apprenticeship related training is greatly improved as a result of making a selection of instructional materials accessible to the user. With all materials in a centralized location, users can be assured of finding the best materials for their programs. The system allows for full-text reviews of microfiche so that users can select materials appropriate to their programs.

Expanded Apprenticeship Programs

Through curriculum sharing more apprentices will be served. The low enrollment trades can be provided with training through the individualized instructional modules made available through the clearinghouse. With the vast number of modules in the clearinghouse library, training programs can be tailored for small groups at a cost effective rate.

Cost Effectiveness

The resources for curriculum development are scarce and continually shrinking at the local levels of education. Sharing of resources eliminates the need for developing new curriculum for many areas. The existing resources can be targeted at the areas of critical need. Low enrollment programs can be served with cost-effectiveness since many materials are readily available for "tailor made" programs. The federal government encourages cooperative programs between institutions and industry as a strategy for cost effectiveness. This project promoted sharing on a national scope. With a target audience of fifty states and Canada, the services are more cost effective than individual institutions working on their own.

Time Efficiency

The easy access to instructional materials in a clearinghouse will result in a great time savings. A user institution can, within the hour, determine if suitable materials are available. They will not need to go through weeks of searching through various states, brotherhoods and corporations to find curriculum materials. The time savings can be redirected toward meeting the needs of apprentices who do not have related training available to them.

Updated Curriculum Materials

The clearinghouse made quality judgments on the materials entered into the data base. The user can be assured that materials in the clearinghouse are technologically sound and usable. Criteria was established for acceptance of materials into the data bank. This criteria was applied to each document entered into the data bank.

Planned Curriculum Development

As a result of the clearinghouse activities and the models for design of materials, a planned approach to curriculum development emerged. Individual states will no longer have to develop materials that already exist in other states. Curriculum design and development was targeted toward the unmet needs of apprenticeship. The cooperating states became involved in joint planning and development of materials for shared use.

Emphasis on Updating Materials

As materials become readily available for review in the field, users will find a greater need for updating old materials. Many good materials were developed in the 1970's but have become out-of-date. These materials can be rapidly updated to the recent technological changes. Unfortunately, most curriculum has been developed with grant funds. After the funding stops, there is little incentive for updating the materials. Hopefully, the clearinghouse concept will create a greater awareness of the national investment in curriculum development and develop a continued demand for updating. Updating is highly cost-effective when compared to new curriculum development.

Solution to Low Enrollment Problem

If apprenticeship related training is to remain a viable approach to the education of our work force, all apprenticeable trades must be served by the program. The low enrollment trades have been denied such training because it has never been cost effective for community colleges to deliver to small number of students. The clearinghouse has done much toward resolving the low enrollment problem. The extensive resource bank of individualized modules is made available through the clearinghouse and institutions can "tailor make" programs for the low enrollment areas and remain cost effective in the delivery of training to these groups. Although the low enrollment problem could not be totally resolved in the time frame of this project, a good start was made during these three years. The project will provide leadership for nationwide treatment of the problem.

Involvement in the Technologies of Education

Apprenticeship training has long been regarded as "hands on" training. Today's apprentices need a heavy knowledge component in their training. Since the community college system is responsible for much of the related training, apprenticeship is an integral part of public education. The technologies of education must be emphasized in apprenticeship training along with the skills of the work place. This project is research based and delivered by computer. The apprenticeship programs will benefit from using these technologies and will move toward increased use of educational research, instructional strategies and electronic helpers to deliver training to apprentices.

FINAL EVALUATION REPORT

PHASE III

A MODEL SYSTEM FOR THE DESIGN AND MAINTENANCE OF RELATED INSTRUCTION CURRICULUM FOR APPROVED U. S. DEPARTMENT OF LABOR APPRENTICESHIP OCCUPATIONS

Carl Horstrup, Project Director
Lane Community College
4000 East 30th Street
Eugene, Oregon 97405

Submitted by
E. Wayne Courtney, Third Party Evaluator
3220 N. W. Arrowood Circle
Corvallis, Oregon 97330
(503) 758-7325

September 10, 1989

INTRODUCTION

THE THIRD PARTY EVALUATOR'S ROLE DURING THIS PHASE WAS TO EVALUATE THE PROCESSES UTILIZED FOR THE PROJECT AND TO SUBSTANTIATE THE FULFILLMENT OF THE OBJECTIVES INCLUDED IN THE PROJECT PLAN FOR THE TIMEFRAME ENCOMPASSED BY PHASE III.

THE PROJECT HAS COMPLETED ITS THIRD PHASE IN ACCORDANCE WITH THE GRANT'S OBJECTIVES. THIS REPORT COVERS PROJECT ACTIVITIES WHICH HAVE BEEN CONCLUDED DURING PHASE III. PREVIOUS REPORTS HAVE ENCOMPASSED PHASE I AND II ACTIVITIES FOR THE PROJECT. PHASE III OF THE PROJECT HAD AS ITS MAJOR ROLES THE CONTINUING EVALUATION OF THE DIRECTORY AND MATERIALS DISSEMINATION.

THE FIELD EVALUATION OF THE DIRECTORY IS COMPLETE WITH SITES REPRESENTING SELECTED STATES AND PROVINCES IN THE UNITED STATES (SEE FIGURE 1) AND AUSTRALIA PROVIDING DATA INPUT. THE RESULTS OF THESE DATA WERE INCLUDED IN EARLIER REPORTS AND INDICATED SATISFACTION IN TERM OF PRACTICAL USAGE.

COMPUTERS FOR THE PROJECT ARE OPERATIONAL AT THE LANE COMMUNITY COLLEGE SITE. THE SOFTWARE FOR THE PROJECT HAS ALLOWED FOR THE CREATION OF FOUR (4) DATABASES. THE INPUT FORMAT FOR THE SYSTEM PROVIDES FOR THE USE OF A THESAURUS WHICH IS BASED TO A LARGE EXTENT UPON THE ERIC THESAURUS TERMS (SEE APPENDIX). THE UTILIZED FORMAT SHOULD ADEQUATELY MEET THE FUTURE REQUIREMENTS FOR THE OPERATION OF THE CLEARINGHOUSE AS IT MOVES INTO POST-FUNDING PHASING.

PHASE III PROGRESS

THE REPORT COVERS THE PHASE III OBJECTIVES AS THEY WERE DEVELOPED IN THE PROJECT PLAN.

OBJECTIVE 4.3. CONDUCT FIELD TEST ON CLEARINGHOUSE SERVICES.

THE FINAL DATA WHICH WERE COMPILED ON THE EVALUATION OF THE DIRECTORY WERE GIVEN IN THE JANUARY 12TH REPORT. SINCE THAT TIME THERE HAS BEEN NO ADDITIONAL INPUT BY FIELD REVIEWERS. MEAN SCORES WERE COMPUTED FOR EACH OF FIVE (5) CRITERIA AND WERE BASED ON A 4-POINT SCALE. THE SUMMARY DATA ARE AS FOLLOWS:

CRITERIA	MEAN SCORE
ORGANIZATION OF THE DIRECTORY	3.36
COMPLETENESS OF THE INSTRUCTIONS. . . .	3.71
TECHNICAL ACCURACY OF THE CONTENT . . .	3.45 *
CLARITY OF THE INCLUDED CONTENT	3.57
GENERAL UTILITY OF THE DIRECTORY FOR FIELD USE	3.64

* NOTE: THE EVALUATIONS FOR TECHNICAL ACCURACY REPRESENT 79% OF THE RESPONDING SITES. OTHERS REPORTED THAT THEY HAD NOT TESTED THE 'TECHNICAL ACCURACY OF THE CONTENT' CRITERION.

THESE MEASURES INDICATE A HIGH DEGREE OF ACCEPTANCE FOR THE UTILITY OF THE DIRECTORY AND ARE JUDGED TO BE VALID GAUGES OF THE FITNESS OF THESE MATERIALS FOR FIELD USE. IT HAS BEEN RECOMMENDED THAT AN INDEX BE ADDED TO THE DIRECTORY AND THIS IS BEING IMPLEMENTED IN ACCORDANCE WITH OBJECTIVE 4.5.2 CRITERIA (SEE VENDOR DIRECTORY MEMORANDUM IN THE APPENDIX).

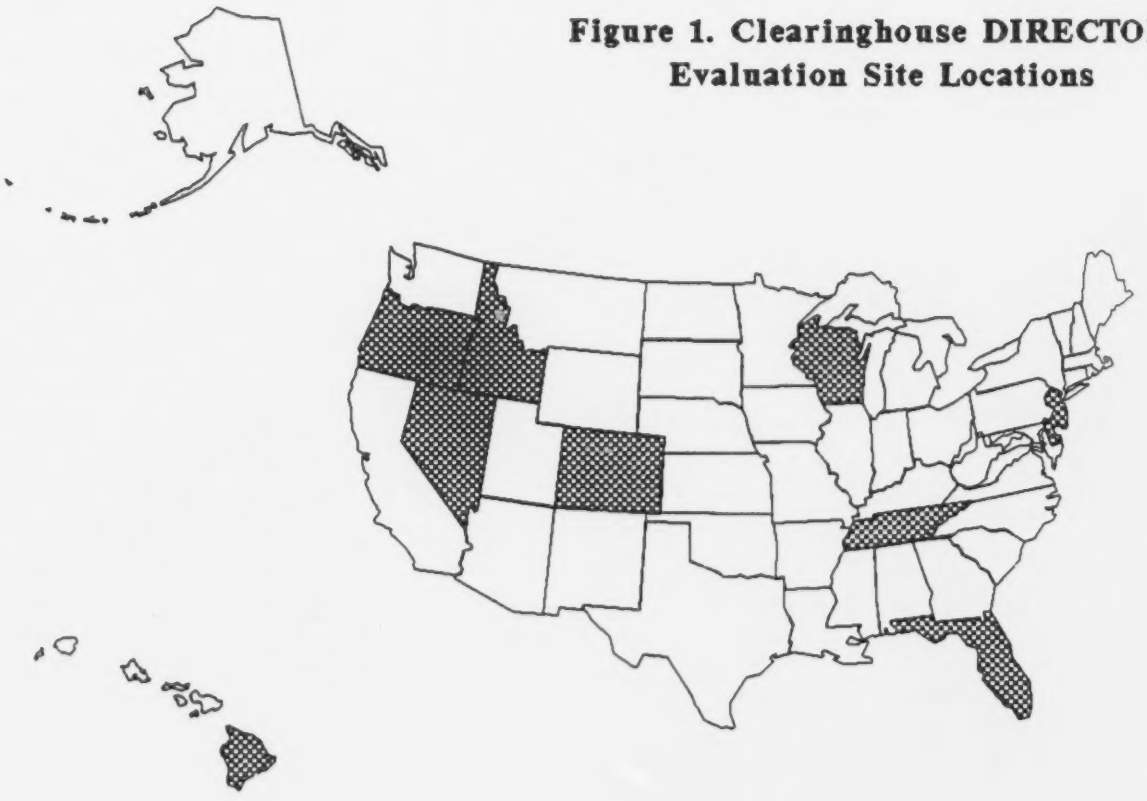

Figure 1. Clearinghouse DIRECTORY Evaluation Site Locations

OBJECTIVES 4.5 AND OBJECTIVE 6.1.3 — REVISE MODEL ACCORDING TO EVALUATIONS FROM FIELD TEST SITES

KEY PROJECT PERSONNEL HAVE BEEN MADE AWARE OF THE RESULTS OF THE FIELD REVIEWS. MINOR CHANGES HAVE BEEN MADE TO THE MODEL AS A RESULT OF THESE EVALUATIONS.

OBJECTIVE 5.1. DEVELOP MAILING LISTS OF INSTITUTIONS, PRIVATE FIRMS AND ORGANIZATIONS THAT ARE POTENTIAL USERS OF APPRENTICESHIP MATERIALS.

THE PROJECT HAS BEEN ENDORSED BY MOST OF THE MAJOR APPRENTICESHIP GROUPS AND ORGANIZATIONS, INCLUDING THE U.S. DEPARTMENT OF LABOR AND THE AMERICAN ASSOCIATION OF COMMUNITY AND JUNIOR COLLEGES. HARDCOPIES OF THE APPRENTICESHIP MATERIALS WILL BE AVAILABLE FOR DISTRIBUTION FROM THE CENTER AT LANE COMMUNITY COLLEGE AS IT BECOMES OPERATIONAL DURING THE 1989-90 YEAR. VENDORS HAVE GIVEN WRITTEN PERMISSION TO COPY THEIR MATERIALS.

OBJECTIVE 5.2. DEVELOP INFORMATION PACKAGE FOR DISSEMINATION AND
OBJECTIVE 5.5. CONDUCT INSERVICE WORKSHOPS ON CLEARINGHOUSE SERVICES.

CLEARINGHOUSE BROCHURES ARE AVAILABLE ON REQUEST FROM THE PROJECT DIRECTOR'S OFFICE ON THE LANE COMMUNITY COLLEGE CAMPUS. BROCHURES WERE DISTRIBUTED AT TWO APPRENTICESHIP INSTRUCTOR WORKSHOPS WHICH WERE CONDUCTED AT COTTAGE GROVE AND WILSONVILLE (OREGON) DURING THE PHASE III PERIOD. DISCUSSIONS REGARDING THE USE OF THE CLEARINGHOUSE BY APPRENTICESHIP INSTRUCTOR AND OTHER INTERESTED PARTIES CONSTITUTED A MAJOR FOCUS FOR THOSE IN ATTENDANCE AT THESE TWO-DAY SESSIONS. WORKSHOP PARTICIPANTS INCLUDED APPRENTICESHIP INSTRUCTORS FROM THROUGHOUT THE STATE OF OREGON.

Objective 3.1 Establish a computerized database and Objective 7.3 Continue to update and expand the materials resource bank for quality improvement

The database records have been registered into the UNIX system. The restructuring of the downloaded records precludes duplication into any copyright databases. A total of 2647 records have been read into the program for purposes of initial use. Abstracts will not be loaded because of potential copyright problems. Records have been utilized from the following sources:

National Technical Information Service (NTIS)
(341 records)
Vocational Education Curriculum Materials (VECM)
(745 records)
Research in Vocational Education (RIVE)
(543 records)
ERIC (1008 records)

The Project has purposely avoided the Ontario Education reports (ONED), AV Online Multimedia, and NICEM documents because of the copyright matter (see Appendix for Original List of Databases). The policy of the Project staff is to avoid confrontation with the copyright issue.

Vendor documentation showing database fields and coding information is shown in the Appendix (see Vendor Directory memorandum). Modifications have been made in the materials resource bank for purposes of allowing for a broader spectrum of user needs.

A Directory of Company Information Thesaurus has been designed to facilitate the database operation. As the documentation of the vendors is completed, the database may be searched by specific topics in the material type (MT) field by company name, location, area code, etc. The input form contains a basic information capability with the addition of a FAX number, with the telephone number being split into two fields, listing toll and toll-free status. In using the field for material type (MT), the words used for input need to come from the Thesaurus (see Appendix B) to include all words that apply; the users may use up to fifteen terms. Within the Thesaurus, the bold faced words are the preferred terms to be used in the MT field. UF

REPRESENTS 'USED FOR' AND BT MEAN 'BROADER TERM'. FOR EVERY TERM PLACED INTO THE MT FIELD THERE WILL BE A BT TERM FOR THE DESCRIPTOR FIELD, WHICH WILL BE USED TO BUILD A SUBJECT INDEX FOR THE COMPANY DIRECTORY AT PUBLICATION TIME. THE GEOGRAPHICAL FIELD AND THE VENDOR TYPE FIELDS ARE SORT FIELDS WHICH MAY BE UTILIZED TO PUT OUT A PAPER DIRECTORY. THE FINISHED PRODUCT WILL CONTAIN AT LEAST THREE SECTIONS LISTING THE RESOURCE BY MATERIAL TYPE, VENDOR TYPE, AND BY GEOGRAPHICAL LOCATION. THE VOCABULARY WILL BE MODIFIED OVER TIME TO REFLECT THE DEMANDS AND NEEDS OF THE PROJECT. WHEN THE PROCESS OF DOCUMENTING VENDORS IS COMPLETE, IT WILL BE POSSIBLE FOR THE USER TO OBTAIN A PRINTED DIRECTORY WHICH IS CREATED BY DOWNLOADING AN ASCII FILE AND EDITING IT WITH DESKTOP PUBLISHING SOFTWARE, ACTUAL REMOTE COMPUTER SEARCHING, OR DOWNLOADING SPECIFIC LISTS TO EITHER 5 1/4 OR 3 1/2 INCH FLOPPY DISKS. (NOTE: THE ABOVE INFORMATION WAS INCLUDED IN A PREVIOUS EVALUATION REPORT.)

THE OPERATIONAL ASPECTS OF THE CLEARINGHOUSE ARE ONLY IN AN EMBRYO STAGE OF DEVELOPMENT AS A RESULT OF THE FUNDED PROJECT. THE FUTURE OF THE CLEARINGHOUSE ITSELF WILL DEPEND HEAVILY UPON MANAGEMENT DECISIONS AND A CONTINUING USE BY PEOPLE WITH APPRENTICESHIP INTERESTS IN THE FIELD. HOWEVER, THE LOGIC IS SOUND THAT THE CLEARINGHOUSE OPERATION WILL HAVE A BRIGHT AND VIGOROUS FUTURE.

GIVEN THE NATURE OF THE PROJECT, THE HARDWARE AND SOFTWARE SELECTED FOR IMPLEMENTATION OF THE CLEARINGHOUSE AND FOR THE HANDLING OF DATABASES WERE REASONABLE COMPROMISES. THE SYSTEM PERMITS REMOTE ACCESS AND HAS A BUILT-IN ACCOUNTING SYSTEM FOR TRACKING USERS. THE SOFTWARE IS AN INTERFACE WHICH IS CURRENT TO STANDARD ONLINE INFORMATION PROGRAMS.

A SYSTEMS SPECIALIST WHO UNDERSTANDS THE UNIX SYSTEM, WHO CAN LOAD PREPARED FILES, AND WHO UNDERSTANDS DATABASES WILL BE A NECESSARY STAFFING ARRANGEMENT FOR THE CLEARINGHOUSE. THIS, PERHAPS ABOVE ALL ELSE, IS CRITICAL TO ITS FUTURE (SEE K. STARR CORRESPONDENCE IN APPENDIX).

THE PROJECT HAS SATISFACTORILY COMPLETED THE INTENT OF THE PROJECT'S PHASE III OBJECTIVE IN ACCORDANCE WITH THE CONDITIONS OF THE GRANT.

APPENDICES

Original List of Databases

Databases Used for the Apprenticeship Clearinghouse

Record Fields for the Apprenticeship Database

Memorandum (Directory of Company Information)

Memorandum (Field Labels for Two Databases)

Memorandum (Vendor Database on the FIPSE Computer)

Memorandum (Vendor Directory)

Memorandum (Vocational Education Curriculum Materials -VECM Subfile

Memorandum (RIVE Subfile)

Memorandum (NTIS Subfile)

Memorandum (Apprenticeship Clearinghouse)

Programming Sheets

ORIGINAL LIST OF DATABASES

ERIC

Resources in Vocational Education

Vocational Education Curriculum Materials

Ontario Educational Resources

National Technical Information Service

AV Online

GPO Monthly Catalog

GPO Publications Reference File

NICEM

DATABASES USED FOR THE APPRENTICESHIP CLEARINGHOUSE

ERIC

Resources in Vocational Education

Vocational Education Curriculum Materials

National Technical Information Service

RECORD FIELDS FOR THE APPRENTICESHIP DATABASE

Karen J. Starr

Pacific Crest Research & Services Corporation
Corvallis, Oregon

February 19, 1987

Prepared in compliance with the agreement of September 16, 1986, between Lane Community College and Pacific Crest Research & Services Corporation.

RECORD FIELDS FOR THE APPRENTICESHIP DATABASE

The development of an electronic database necessarily involves the merger of hardware, software, and the human element. This merger occurs within the greater arena of the information industry and its standards. How these dynamic and ever changing factors are dealt with directly influences the quality of the resulting database and its value as a marketable product.

The way a publication is represented in the database will be a reflection of the nature of the information, the editorial needs and policies of the Clearinghouse, and the user's need to retrieve the information. The technology currently being used by the information industry is based on coordinate indexing, commonly used in the 1950's and 1960's, and the record structure developed by the publishing industry during the early 1900's. From a user and retrieval point of view, this technology is anything but ideal. It is currently the industry standard, however, and consideration of prototype searching technology, like artifical intelligence, is not feasible from either a technological or financial perspective at this time. That does not preclude consideration of such technology at some future point.

Within the information industry's framework, the Clearinghouse must develop a number of editorial policies. One such policy includes the selection of fields which will form the records representing the information the database will index. A field is a piece of information about a publication. Examples include the author or authors, the title, or the source of publication. These fields usually have labels represented by mnemonics. One example is the author field with the mnemonic "AU."

Before attempting to recommend record fields for the apprenticeship database, a review of a number of commercially available databases was made. These included ERIC, Resources in Vocational Education, Resources in Computer Education, Ontario Education Resources Information Database, Vocational Education Curriculum Materials, and the School Practices Information File. These files are currently available on BRS Information Technologies in Latham, New York, and reflect the industry standards used in the management of the education literature.

The labels from all of the listed files were compared for uniqueness as well as consistency of use. Selection of labels was made on the basis of searching experience, patron need, and producer usage within the philosophical framework that suggests product familiarity has a direct influence on product marketability. Those labels which are the most valuable are described in "Required Data Elements." Often users have need for information which is useful for the identification of an article. These labels are listed in "Other Necessary Data Elements." Finally, there are other types of information which are useful from an information retrieval perspective, and are included in "Optional Data Elements." The use of these items

will require an editorial policy decision on the part of the Clearinghouse taking into consideration hardware, software, and user needs.

REQUIRED DATA ELEMENTS

Accession Number (AN)

The accession number is a unique identification number which has been arbitrarily and sequentially assigned to each document as it is entered into the database. The accession number can be developed in a number of ways reflecting the intent and need of the producer.

Recommendations:

1. The number should begin with a prefix representing the Apprenticeship Clearinghouse followed by numbers representing the sequential addition of the record into the system. One example might be the first two numbers representing the year the citation first appeared with the next four numbers representing the abstract number within that year.

2. The apprenticeship database will draw a number of its records from the ERIC database. Documents in the ERIC database are assigned an accession number beginning with ED. Journal articles are assigned a number beginning with EJ.

    a. The ED number can be used to access ERIC document collections which are available in college and university libraries on a national basis. This same number can be used to order ERIC documents from their facility in Virginia. This number should be included in the accession field.

    b. If the accession field is directly searchable, the presence of the ED number will allow the requester to eliminate duplicate citations from a literature review which have already been obtained through a search of the ERIC database. The recommendation to make this option available is made with the consumer in mind.

3. Computerized databases are usually updated on a monthly basis. The accession number field should include an update code which represents the year and the month the record entered the database; i.e., 8701 stands for January 1987.

    a. From a searching point of view this code is useful. An example is the ability to limit the information retrieved in a search to a designated part of the file as part of a current awareness review of the literature.

b. The update code can also occur in a record as a separate field.

Comment: The recommendation to include ERIC document numbers in the accession field is made with the consumer in mind. While the producer will potentially loose royalty charges on those citations, there are several scenarios which will occur. People interested in apprenticeship material will use the producer's database because the database will include a strong collection of material not available anywhere else. The consumer population consisting primarily of librarians and educators coming from a generalist's point of view will be the group most likely to eliminate the duplicate ERIC citations. The producer has other very important markets. These include apprenticeship specialists, vocational education specialists, and the private sector such as Freightliner. These individuals will very likely opt to search only the apprenticeship database because it will satisfy their specialized needs. For professional practitioners, comprehensive literature reviews are unnecessary. They just want what fulfills their immediate need. This group will probably not eliminate the ERIC duplicates.

Author (AU)

The author data field most often includes what are known as personal authors and editors. Corporate authorship is represented elsewhere in a record. Education oriented files very often include up to two authors only. When an article has more than two authors, the rest are dropped and the words "and others" fill out the field.

Recommendations:

1. Names should be entered as they appear on the original source document with the last name first, followed by the first name or initial, and the middlename or initial.

2. An editorial decision needs to be made regarding the number of authors included in the author field which takes into account the information seeking needs of the database user. The ERIC model is certainly useful. Input from the Advisory Committee would also be appropriate along with a review of those journals considered standards in the education field. From an information retrieval point of view it is useful to have more than two authors listed in a multi-authored article.

Author Affiliation (IN)

This field contains the name of the institution with which the author was affiliated at the time the work was published. It is particularly useful for users who have need to identify the "gray, or invisible, college" of specialists in their area of research. More than one institution may appear in this paragraph. It can also be used to include the corporate author of a work; i.e., a work produced by a corporate entity rather than an individual or group of individuals.

Title (TI)

This data field includes the title of the document. If and when an editorial decision is made to include non-English publications, this field can also include the title as it is written in English. Such "fabricated titles" are enclosed in brackets to set them off from the real titles.

Source (SO)

The source field contains the journal title, volume and issue number, pagination and publication date for all citations to journal articles. This field does not show in citations which are of a document nature.

Recommendation:

1. An editorial decision needs to be made regarding how the journal title will appear in this field. A number of databases abbreviate their titles. Such an approach is confusing to users who expect titles to be spelled out as they appear on the cover of the journal. With the consumer in mind, it would be more appropriate to follow the ERIC model where the titles are spelled out in full.

Availability (AV)

This field contains information on where the cited document may be obtained; i.e., commercial or other publishers, ERIC, or the Apprenticeship Clearinghouse. It is the field used for all material not published in a journal. Journal articles show such information in the source field. All addresses in the availablity field need to be spelled out in full. States and zip codes need to be standardized.

Descriptors (DE)

Descriptors are controlled vocabulary terms or keywords used to represent the subject orientation of the article or document. They are extremely useful from a searching point of view.

Recommendations:

1. The Thesaurus of ERIC Descriptors should be used as the authority list for all descriptors assigned to articles entered into the apprenticeship database.

2. An editorial policy decision needs to be made about the number of descriptors assigned to each article. The ERIC model should be looked at closely as a standard.

3. An editorial policy decision needs to be made regarding whether it would be to the user's advantage to have the descriptor field broken into major and minor descriptor designations. This can be a useful retrieval tool as a means of establishing subject specificity in reviews which retrieve large amounts of information. A user can easily request those items in a search that have a designated topic as the major subject orientation.

Identifiers (ID)

Identifiers are natural language terms used to describe specific concepts or subjects discussed in a document for which no ERIC thesaurus terms are available. Such terms might represent concepts unique to the apprenticeship field which are not commonly used elsewhere in education. There is an identifier authority list used by ERIC that can be helpful.

Year of Publication (YR)

This is a four digit year of publication of the document or article. Normally in the case of articles, this information shows up in the source field. It is not included in the availability field which shows source of publication for documents. For consistency purposes it is appropriate to include the year of publication in a separate field across the entire database. The field is used for searching purposes when the user wants to limit the resulting bibliography to a certain time period. Because we are moving out of the 1900's into the 2000's, it will be appropriate to include all four digits of the year to avoid confusion in the future between centuries.

Abstract (AB)

The field is a 50-200 word abstract of the article or document. This abstract can be generated by the Apprenticeship Clearinghouse, taken from database literature reviews with copyright permission, or taken from the author abstract which is often included with a journal article. The field provides information about the article or document which tells the user whether it is going to be useful and worth obtaining a copy of the original article. It is also useful for searching purposes since citations can be retrieved based on the occurrences of requested terms within the abstract field. When a topic is new this is often the only way material can be retrieved, since a word might appear in the abstract and not in the title or the keywords.

OTHER NECESSARY DATA ELEMENTS

Pagination (PG)

Pagination indicates the number of pages contained in the original document or journal article. This information can be useful when a user is interested in

ordering the original document from either the Apprenticeship Clearinghouse or ERIC.

Geographic Source (GS)

This field represents the country of origin or place of publication. Within the United States, the information extends to the state level. In Canada, it extends to the provincial level. In the case of all other countries, no further divisions need be made.

Recommendation:

1. Various databases handle geographic locations in various ways. For example, some spell the names out and others use two letter symbols. An editorial decision needs to be made with the ERIC model in mind.

Number (NO)

Often documents are published as a result of contract work that will be useful additions to the database. These publications will include a grant, contract, report, or project number. Such numbers often show up in citations to the document. Including such a data field would aid searchers who often have very little to go on when trying to verify a document's existence.

Sponsoring Agency (SN)

This is the name of the agency which sponsored the research or report. It is particularly useful when searching for reports when it is an unknown whether the report was issued under the primary investigator's name or the agency's name.

Language of Publication (LG)

An editorial decision needs to be made regarding the addition of non-English publications, particularly if Canadian material is added. This is also important if U.S. produced material is included that is aimed at minority groups such as the Hispanics. From a searching point of view, it is valuable to include the field for those individuals who want to see only English language materials. Even if the majority of the file is composed of English, an accommodation to other languages needs to be made. It is easier to include the field and annotate the records from the beginning than to go back in the future and reload the file.

Governmental Status (GV)

This data element indicates whether a document is a publication of a governmental body. It should reflect whether the body is federal, state, local, or international.

OPTIONAL DATA ELEMENTS

Price Codes (PR)

Codes can be included in this field to reflect the current price of documents available from the Apprenticeship Clearinghouse.

Descriptive Note (NT)

The note field can be used to include information that will augment the description of the document as presented in the other fields. Such information might include a series notation, thesis notes, relationship to other documents, or conference or convention presentation dates.

Publication Type (PT)

This includes the format of the publication and the field may include as many as three codes. These codes are used in the ERIC database and are listed in the Thesaurus of ERIC Descriptors.

Target Population (TP)

There are a variety of special population groups which can be identified. The records can be tagged with these labels as appropriate.

Educational Level (EL)

Educational levels are assigned only if they are designated specifically in a report. They are assigned primarily to curriculum materials. In other materials this information will be included in the descriptor field with such terms as elementary schools or secondary schools.

Mode of Instruction (MI)

The information in this field includes the type of instruction and variety of instructional techniques offered by a particular curriculum.

Instructional Information (II)

This contains information regarding the objectives to be obtained by a student through utilization of a particular curriculum. Prerequisite knowledge and skill are also detailed in the field.

Material Type (MT)

Types of educational materials are represented typically as evaluation measures, handbooks, statistical tables, resource documents and guidelines.

Material Status (MS)

The field indicates the status of curriculum materials. "In progress" means in development or ongoing research. Available curriculum documents are tagged as either "current" or "superseded."

Special Features/Components (SC)

These would include such items as bibliographies, appendices, tables, charts, and literature reviews. Such information can be useful when, for example, a researcher would be interested in a review article.

Tests/Instruments (TE)

Names of tests which are included in the document appear here as well as the tests or instruments used in research but not included in the document.

Intended User (IU)

This field includes the general category of user for whom the material was intended.

Nonprint Media (NM)

The type of nonprint material and a physical description would appear in this field.

Copyright Information (CI)

This includes information concerning any copyright restrictions on the use of curriculum materials. Serious consideration of this field should be made by the Clearinghouse.

Comment: Those data elements listed in this section are nice to have from a searching perspective, but are what one might consider "icing on the cake." A number of appendices have been attached to this report which illustrate how other databases have used these labels.

CONCLUSIONS

It is important to remember that a record can be created within a database framework which includes any number of fields representing all types of information. The above fields have been recommended in a heirarchy which is representative of their value from a user's point of view for purposes of retrieval within the education discipline. The Clearinghouse needs to establish a number of editorial policies for the development of its database. These need to be made within the organizational structure the Clearinghouse decides to adopt and will be influenced by the hardware the database will be housed on and the software used to retrieve information from that database, and the user community.

22 December 1988

MEMORANDUM

TO: Burr
Carl
Wayne

FROM: Karen

RE: Directory of company information

The software that Carl purchased for this project can be used to create as many databases as the computer has storage capacity. Burr and I talked about a database of company information. I went through the work that Burr did for the publication, put a layer of computer/information science on top and the attached is the result.

The input form has the basic information that Burr used with the addition of a line for a fax number. The telephone number has been split out to two fields listing toll versus toll-free. I built in some other fields after looking at a number of published directories and considering the capabilities of the BRS software and desktop publishing. There are some computer fields I have left off the input form that deal with update codes and the like.

There is a field for material type (MT) on the input form. The words used in this field need to come from the attached "thesaurus" and should include all words that apply up to fifteen terms. I went through the words Burr used to describe the companies, made a list, went through the ERIC thesaurus, compared Burr's list, made it conform to the ERIC thesaurus, dropped some ERIC terms as too general for the user community, and added a few apprenticeship terms. The bold faced words are the preferred terms to be used in the MT field. UF means used for. BT means broader term. For every term put into the MT field there should be a BT term for the descriptor field.

The descriptor field will be used as a sort field to build a subject index for the company directory at publication time. The geographical field and the vendor type fields are also sort fields to be used at publication time should the decision be made to put out a paper directory. The finished product would have at least three sections listing by material type, by vendor type, and by geographical location.

I expect the vocabulary to be modified over time to reflect the needs of the project. The ERIC thesaurus is the standard or control mechanism but it won't answer all the vocabulary needs. There is an identifier field for jargon terms that are not now in the ERIC thesaurus and the decision is made to include them.

There needs to be a balance between the needs of the user community and the capabilities of the software. Creating that blend is like walking a tight rope between two worlds, but it can be done and done well.

When the process of documenting the vendors is over there will be a computer database. That database can be searched by specific topics in the material type (MT) field, by company name, by location, by area code, etc. Products can be a printed directory created by downloading an ascii file and cleaning it up in desktop publishing software, actual remote computer searching, and/or downloading specific lists to floppy disk on either 5 and 1/4 or 3 and 1/2 inch floppy disks.

21 May 1989

MEMORANDUM

TO: Wayne

FROM: Karen

RE: Field labels for the two databases.

The database that includes the curriculum, research, and journal material from the four databases I told you about have all been reformated to include the following labels:

AU	Author
IN	Author Affiliation
TI	Title
SO	Source
SN	Sponsoring Agency
NO	Numbers
YR	Year
PG	Pagination
AV	Availability
CI	Copyright Information
LG	Language of Publication
GS	Geographic Source
TA	Target Audience
EL	Educational Level
MT	Material Type
MS	Material Status
DE	Descriptors
ID	Identifiers
NT	Descriptive Note
AB	Abstract

Not all the records will have all the fields. The initial load will be without abstracts because I do not care to set myself up for problems with copyright even on files that are technically not copyrighted. Cautious maybe. Wise probably.

The database that will hold the vendor information has the following fields:

CO	Company Name
AD	Address
CY	City
ST	State
ZP	Zip Code
TE	Telephone Number
TF	Toll Free Number
FN	Fax Number
CP	Contact Person
VT	Vendor Type
GL	Geographical Location
MT	Material Type
DE	Descriptors
ID	Identifiers
NT	Note

Again not all the records will have all the fields. All the vendors from the list that Burr put together have been loaded into a file. I am going to set the file up so that Carl can go ahead and produce the vendor directory part of his project. He needs to see some results. The electronic version will be safely held on the computer in his office until it can be loaded online.

I hope this is what you wanted. Give me a call at home if you need more. I will not be going back to work until June 5. I will either be at home working or in Eugene staring at Carl's computer.

3 June 1989

MEMO

TO: Carl

FROM: Karen

RE: Vendor database on the FIPSE computer

The attached contains a printout of the database that will be loaded on the FIPSE computer under the acronym VEND. The printout includes both the short field labels and the long fields labels in the database. There is a file that also includes the same information as the printout on the FIPSE computer in the DOS partition under the VENDBACK subdirectory and on a disk in the FIPSE disk container. The other file is a loadable file with short input labels that exists both in the VENDBACK subdirectory, in the LOAD subdirectory, and on the aforementioned floppy disk in the FIPSE disk container.

The orginal folder with the forms that Burr filled out are at the bottom of this stack.

I no longer have any copies of the vendor database in machine readable form or on paper in Corvallis. You have them all.

3 June 1989

MEMO

TO: Carl

FROM: Karen

RE: Vendor directory

The attached contains a copy of the vendor directory in near typeset quality. Please edit the copy for errors and lacks. The format is suggested and takes advantage of the capabilities of word processing to a directory like presentation using a typeset quality font. If you let me know what corrections need to be made by July 1, I can do them and you will be ready to go to print. You have in the packet a copy of the word processing file in ascii form (Vend2.asc) that can be taken into WordPerfect by your typist. There are instructions at the beginning of the file that talk about formating. The file would be available for future updates if you choose to do so. The file I printed the enclosed copy from is set in a word processor called Microsoft Word. If you have access to people who work with Word a copy is available upon request.

The part of this packet after the blue sheet is the copy for the indexes. It needs some word processing applied to it. The computer file Index2.asc is an ascii file that will read into WordPerfect with no problems.

As indicated in the verbage at the front of the index file, I no longer have any copies of the vendor directory in machine readable form or on paper in Corvallis with the exception of the Word file. You have them all. Unless you want me to make corrections on the Word file for purposes of sending copy directly to the printer, I am stepping away from the vendor directory. The other packet indicates that the vendor database is ready to load into the software package on the FIPSE computer.

This file includes a listing of vendors that need to be sorted for two indexes to the vendor directory. There is another file that includes the vendor records called vend2.asc. The name of this file is index2.asc.

It is an ascii file that needs to be reformatted in WordPerfect in Times-Roman font. The subjects and the material types in the appropriate sections should be set at 10 point. The names of the vendors listed under those subject/material type headings should be set in Times-Roman font at 8 point. Most WordPerfect software that is set for a Hewlett-Packard laser printer with an enhanced font cartridge will support Times-Roman in those two fonts.

The subject and material type headings should be set for bold faced, and the vendor names plus the numbers should be regular type. It may well be a good idea to set the subject and material type headings in bold faced before you begin inserting the vendor names. The vendor names need to listed in alphabetical order under each heading. The vendor names can be copied individually from the provided listing as many times as are necessary for the appropriate headings. Set the tab for the listing of vendors under each heading at two spaces (see attached example of a subject index). When finished the original vendor listing can be blocked and deleted. See each section marked as Subject Index and Material Type Index for these listings.

At the beginning of each index section I have typed a paragraph explaining the section. These paragraphs should stay intact unless they need to be edited. See the attached example for format.

WordPerfect has the ability to print out in newspaper columns if you set the page format up properly. The file will look like one long column, but when it prints out it will automatically format in as many columns as you request. You may have to do some reformatting of the line length to fit the column length WordPerfect will set for you. At 8 point a lot of text will fit on one page. You might consider asking for only two columns, but three might be interesting to try and see how it looks. The original directory was printed using newspaper columns in Microsoft Word. It is nice handy feature of the software that does all the work for you and makes the directory look professional.

The initial listing of vendors and headings at the time of this files will give you a master list to work from to create the individual indexes. Make sure that each vendor is placed under the headings in the indexes that match the terms accompanying it in the initial listing. This initial listing can be blocked and deleted when you are finished creating the indexes. The material type and subject listings need to corrected for typographical errors and arranged in alphabetically order. Any duplicate headings need to be erased, and missing headings need to be included. The headings can be arranged in order by using the cut and paste functions of WordPerfect or a sort function of the software...if one is available.

This file has a number of copies available in case it is destroyed. There are three floppy disks. The working disk is in your hands. Backup disk number 1 is available in Colleen's collection. Backup disk number 2 is in the FIPSE project floppy disk storage container in the closet. Backup disk number 3 is the hard disk on the FIPSE project computer in the DOS partition in the subdirectory dirback. There are two copies of this file on your disk. One is a working file and one is a backup file with the .bak extension. If this file is destroyed there are plenty of copies. There are now no copies

in Corvallis because I declare myself done and finished with the vendor directory indexes.

Advanced Machinery Imports, Ltd. [1]
Material Type: Mechanical equipment.
Subjects: Construction, cabinetmaking.

Abraxas Basic Courseware [2]
Material Type: Courseware, videotape cassettes, computer software.
Subjects: Mechanics, construction, welding, electronics.

Aerostate Industries, Inc. [3]
Material Type: Mechanical equipment.
Subjects: Construction, manufacturing.

Agency for Instructional Technology [4]
Material Type: Audiovisual aids, curriculum guides, educational media.
Subjects: Applied physics, applied mathematics.

Allen-Bradley [5]
Material Type: Instructional materials, educational media.
Subjects: Computer instruction, communications, electricity.

Amatrol [6]
Material Type: Mechanical equipment.
Subjects: Electricity, manufacturing.

American Association for Vocational Instructional Materials [7]
Material Type: Instructional materials, publications, educational media.
Subjects: Electricity, metals, agriculture, mechanics, plumbing.

The American College Testing Program [8]
Material Type: Tests, courseware, measures, computer software.
Subjects: Trade and industrial education, vocational education.

American Honda Motor Co., Inc. [9]
Material Type: Videotape cassettes.
Subjects: Mechanics.

American Public Power Association [10]
Material Type: Books, audiovisual aids, publications, educational media.
Subjects: Electricity.

American Technical Publishers, Inc. [11]
Material Type: Books, publications.
Subjects: Culinary arts, electricity, mechanics, construction, welding, plumbing, blueprints, metals, drafting.

American Vocational Association [12]
Material Type: Books, publications.
Subjects: Trade and industrial education, vocational education.

Ami Products [13]
Material Type: Educational equipment.

Advanced Machinery Imports, Ltd. *[1]*
PO Box 312, New Castle, DE 19720
Phone: (302) 322-2226
Vendor Type: Private sector firm.
Material Type: Mechanical equipment.
Subjects: Construction, cabinetmaking.
Description: High end specialty woodworking machinery and accessories.

Abraxas Basic Courseware *[2]*
PO Box 1416, Eugene, OR 97440
Phone: (503) 485-6747
Vendor Type: Private sector firm.
Material Type: Courseware, videotape cassettes, computer software.
Subjects: Mechanics, construction, welding, electronics.
Description: Computer software and videotapes on woodshop skills, shop safety.

Aerostate Industries, Inc. *[3]*
222 Valley Road, Wilmington, DE 19804
Phone: (302) 571-9615
Vendor Type: Private sector firm.
Material Type: Mechanical equipment.
Subjects: Construction, manufacturing.
Description: Perforated air film material handling systems.

Agency for Instructional Technology *[4]*
1111 West 17th St, Bloomington, IN 47401
Phone: (812) 339-2203
Contact: Amy Leslie.
Vendor Type: Private sector firm.
Material Type: Audiovisual aids, curriculum guides, educational media.
Subjects: Applied physics, applied mathematics.
Description: Fourteen multimedia units in applied physics and mathematics.

Allen-Bradley *[5]*
1201 South Second Street, Milwaukie, WI 53204
Phone: (414) 382-3534
Vendor Type: Private sector firm.
Material Type: Instructional materials, educational media.
Subjects: Computer instruction, communications, electricity.
Description: Training programs to be delivered in module format with video, text material and training workstations. Programs include computer training, communications and electricity.

Amatrol *[6]*
PO Box 2697, Jeffersonville, IN 47131
Phone: (812) 288-8285
Vendor Type: Private sector firm.
Material Type: Mechanical equipment.
Subjects: Electricity, manufacturing.
Description: Control units for robots, automated manufacturing systems and computerized interfaces.

American Association for Vocational Instructional Materials *[7]*
120 Engineering Center, Athens, GA 30602
Phone: (404) 542-2586
Vendor Type: Network.
Material Type: Instructional materials, publications, educational media.
Subjects: Electricity, metals, agriculture, mechanics, plumbing.
Description: Texts and support material for instruction in agriculture, electricity, metal working, mechanics and plumbing.

The American College Testing Program *[8]*
2201 North Dodge, Iowa City, IA 52243
Phone: (319) 337-1000
Contact: Gene Knutson.
Vendor Type: Private sector firm.
Material Type: Tests, courseware, measures, computer software.
Subjects: Trade and industrial education, vocational education.
Description: Assessment instruments and software for testing ability levels of students.

American Honda Motor Co., Inc. *[9]*
100 West Alondra Blvd, PO Box 50, Gardena, CA 90247
Phone: (213) 327-8280
Vendor Type: Private sector firm.
Material Type: Videotape cassettes.
Subjects: Mechanics.
Description: Forty-three videotapes on measurement tools, electrical systems, emission controls, air conditioning, transmission, carburetion, engines, general technical service management, new model and parts management.

American Public Power Association *[10]*
2301 M Street, NW, Washington, D.C. 20037
Phone: (202) 779-8300
Contact: Julie Parsley.
Vendor Type: Network.
Material Type: Books, audiovisual aids, publications, educational media.
Subjects: Electricity.
Description: A training resource directory of training programs in electrical power.

American Technical Publishers, Inc. *[11]*
1155 West 175th St., Homewood, IL 60403

BEST COPY AVAILABLE

Phone: (800) 323-3471
Contact: Thomas E. Proctor.
Vendor Type: Private sector firm.
Material Type: Books, publications.
Subjects: Culinary arts, electricity, mechanics, construction, welding, plumbing, blueprints, metals, drafting.
Description: Textbooks on technical skills training in skilled trades.

American Vocational Association *[12]*

1410 King St., Alexandria, VA 22314
Phone: (703) 683-3111
Contact: Bill Hornung.
Vendor Type: Network.
Material Type: Books, publications.
Subjects: Trade and industrial education, vocational education.
Description: AVA serves as a dissemination point for materials developed by its membership. Materials include both general and technical subject matter.

Ami Products *[13]*

PO Box 312, New Castle, DE 19720
Phone: (302) 322-2226
Vendor Type: Private sector firm.
Material Type: Educational equipment.
Subjects: Construction, woodworking, cabinetmaking.
Description: High end speciality woodworking machinery and accessories (table saws, shaper, joiner, planer, mortiser, etc.).

Applied Educational Systems, Inc. *[14]*

181 Westover Court, Delran, NJ 08075
Phone: (609) 461-1409
Contact: James B. Schultz.
Vendor Type: Private sector firm.
Material Type: Instructional materials, educational media.
Subjects: Mechanics, auto mechanics.
Description: Technical training system with curriculum package in the areas of automotive, HVAL and process control and instrumentation. Automotive systems include electrical/electronic, wiring hareness, direct ignition and EFI.

Applied Management Systems *[15]*

700 Hembree Place, Suite B, Roswell, GA 30076
Phone: (404) 442-1945
Contact: Tom Shore.
Vendor Type: Private sector firm.
Material Type: Audiovisual aids, educational media.
Subjects: Management systems, training.
Description: Audiovisual aids related to establishing management systems in training programs.

Arizona Center for Vocational Education *[16]*

Northern Arizona University, Box 6025, Flagstaff, AZ 86011
Phone: (602) 523-5442
Vendor Type: Network.
Material Type: Curriculum guides, instructional materials.
Subjects: Agriculture, mechanics, allied health, textiles, computers, electronics, food services, word processing.
Description: Research reports, monographs, and curriculum guides.

Armstrong Medical Industries, Inc. *[17]*

3660 Commercial Avenue, Northbrook, IL 60062
Phone: (312) 272-5577
Contact: Warren Armstrong.
Vendor Type: Private sector firm.
Material Type: Books, audiovisual aids, publications, educational media.
Subjects: Allied health.
Description: Books and audiovisuals in the field of allied health.

Asphalt Institute *[18]*

Asphalt Institute Building, College Park, MD 20740
Phone: (301) 277-4258
Vendor Type: Private sector firm.
Material Type: Books, audiovisual aids, publications, educational media.
Subjects: Construction, asphalt.
Description: Publications and audiovisuals for the asphalt industry.

Associated Builders and Contractors *[19]*

729 15th Street, NW, Washington, D.C. 20005
Phone: (202) 637-8800
Contact: Frederick Powers.
Vendor Type: Network.
Material Type: Instructional materials, educational media.
Subjects: Construction, electricity, metals, plumbing.
Description: Competency based, task oriented training programs in construction, electricity, metals and plumbing. Over 500 instructional modules are available.

Associated General Contractors of America *[20]*

1957 E Street, NW, Washington, D.C. 20006
Phone: (202) 393-2040 x287
Vendor Type: Network.
Material Type: Learning modules, instructional materials.
Subjects: Carpentry, masonry, bricklaying, construction, millwright, heavy equipment mechanic.
Description: Competency based learning modules.

Audel Library, Macmillan *[21]*

BEST COPY AVAILABLE

Publishing Company
866 3rd Avenue, New York, NY 10022
Vendor Type: Private sector firm.
Material Type: Books, publications.
Subjects: Carpentry, drafting, hydraulics, pneumatics, electricity, mechanics, plumbing, metals.
Description: A practical arts library for skilled craftsmen in electrical, mechanical, plumbing, metals, carpentry, maintenance, drafting, hydraulics and pneumatics.

Autodesk, Inc. *[22]*
2320 Marinship Way, Sausalito, CA 94965
Phone: (800) 445-5415
Vendor Type: Private sector firm.
Material Type: Computer assisted instruction, computer uses in education, programmed instruction.
Subjects: Drafting, graphics.
Description: A full function computer aided design package. Company sells autosketch and autocad programs.

AVI Publishing Co., Inc. *[23]*
250 Post Road East, PO Box 831, Westport, CT 06881
Vendor Type: Private sector firm.
Material Type: Books, publications.
Subjects: Culinary arts, allied health.
Description: Textbooks in culinary arts, allied health and other areas.

Bennett and McKnight Division, Glencoe Publishing Company *[24]*
15319 Chatsworth Street, Mission Hills, CA 91345
Phone: (818) 990-3080
Vendor Type: Private sector firm.
Material Type: Books, audiovisual aids, instructional materials, publications, educational media.
Subjects: Trade and industrial education, vocational education.
Description: Basic textbooks in all trade areas. Includes teacher manuals, student materials and visual aids.

Bergwall Productions, Inc. *[25]*
PO Box 238, Garden City, NY 11530-0238
Phone: (800) 645-3565
Vendor Type: Private sector firm.
Material Type: Filmstrips, slides, videotape cassettes, nonprint media, transparencies.
Subjects: Automotive, diesel, metals, drafting, electronics.
Description: Filmstrips, slides and video cassettes for automotive and diesel training. Materials for drafting, metals and electronics are also available.

Blue Streak Company *[26]*
PO Box 607, Hillsboro, OR 97123
Phone: (503) 640-4200
Contact: Gene Small.
Vendor Type: Private sector firm.
Material Type: Mechanical equipment.
Subjects: Metals, welding.
Description: Welding simulator trainer that allows students to practice welding techniques without hood or gloves.

Bon Tool Company *[27]*
4430 Gibsonia Road, Gibsonia, PA 15044
Phone: (412) 443-7080
Contact: Carl Benginanni.
Vendor Type: Private sector firm.
Material Type: Hand tools.
Subjects: Masonry, construction, bricklaying.
Description: Formerly masonry speciality company. Tools and equipment for all masonry trades.

Brady Co./Prentice Hall *[28]*
Prentice Hall Building, Englewood Cliffs, NJ 07632
Phone: (800) 638-0220
Contact: Matt McNearney.
Vendor Type: Private sector firm.
Material Type: Books, audiovisual aids, publications, educational media.
Subjects: Construction, electricity, electronics, metals, plumbing, drafting.
Description: Textbooks, reference books and educational media for technical trades.

Breton Publishers *[29]*
Statler Office Building, 20 Park Plaza, Boston, MA 02116
Phone: (800) 354-9706
Vendor Type: Private sector firm.
Material Type: Books, instructional materials, publications, guides.
Subjects: Trade and industrial education, vocational education.
Description: Textbooks and study guides on a wide range of technical subjects.

Broadhead Garrett Company *[30]*
National Headquarters, 4560 East 71st Street, Cleveland, OH 44105
Phone: (800) 321-6730
Vendor Type: Private sector firm.
Material Type: Hand tools, mechanical equipment, audiovisual aids, instructional materials, educational media.
Subjects: Electricity, electronics.
Description: Full range of instructional equipment, supplies and audiovisual aids.

Building Tech Bookstore, Inc. *[31]*
7177 SW Stephen Lane, Portland, OR 97225

Phone: (503) 297-7177
Vendor Type: Private sector firm.
Material Type: Books, publications.
Subjects: Construction, electricity.
Description: Books on electrical codes and electrical wiring.

Business and Industry Unit, American Association for Adult and Continuing Education. *[32]*

1201 16th Street, NW, Washington, D.C. 20036
Vendor Type: Network.
Material Type: Professional services.
Subjects: Adult basic education, continuing education.
Description: Identifies and highlights business, industry and union efforts to provide employees with the basic education to do their jobs. It can provide cost effective program ideas to local operators.

Butterworth Publishers *[33]*

80 Montvale Avenue, Stoneham, MA 02180
Vendor Type: Private sector firm.
Material Type: Books, publications.
Subjects: Alarm systems, security personnel.
Description: Books on security alarms, security management and special purpose security.

CA Career Aids, Inc. *[34]*

20417 Nordhoff Street, Department D34, Chatsworth, CA 91311
Phone: (818) 341-8200
Vendor Type: Private sector firm.
Material Type: Courseware, videotape cassettes, multimedia instruction, computer software, teaching methods.
Subjects: Drafting, electricity, electronics, metal working, automotive shop safety, building trades, robotics.
Description: Software, video and multimedia materials for drafting, electricity, electronics, metal working, automotive shop safety, building trades and robotics.

Cadkey, Micro Control System, Inc. *[35]*

27 Hartford Turnpike, Vernon, CT 06066
Phone: (203) 647-0220
Contact: Christine Donovan.
Vendor Type: Private sector firm.
Material Type: Courseware, instructional materials, computer assisted instruction, computer software, educational media, programmed instruction.
Subjects: Drafting.
Description: Computer aided instruction system that includes software and training manual.

California State Department of Education *[36]*

721 Capitol Mall, Sacramento, CA 95814-4785
Vendor Type: Network.
Material Type: Instructional materials, educational media.
Subjects: Construction, meatcutting, culinary arts, mechanics.
Description: Have a wide variety of guides, tests and learning modules for various apprenticeable trades.

Career Success Magazine *[37]*

1200 East Highway 210, Liberty, MO 64068
Phone: (800) 331-2496
Contact: Jim Dick.
Vendor Type: Private sector firm.
Material Type: Books, audiovisual aids, publications, educational media.
Subjects: Trade and industrial education, career education.
Description: Magazine devoted to career information.

Cascade Graphics Systems *[38]*

16842 Von Karmon Avenue, Irvine, CA 92714
Phone: (714) 474-6200
Contact: Ted James.
Vendor Type: Private sector firm.
Material Type: Computer assisted instruction, programmed instruction.
Subjects: Drafting, graphics.
Description: An educational system for training students in computer aided drafting/design systems.

CES Industries, Inc. *[39]*

130 Central Avenue, Farmingdale, NY 11735
Phone: (516) 293-1420; (800) CES-LAB1 (Outside NY); (800) CES-LAB2 (Inside NY).
Vendor Type: Private sector firm.
Material Type: Instructional materials, books, audiovisual materials, educational media, publications.
Subjects: Electronics, microprocessors, robotics.
Description: Training systems for high tech courses in electronics, microprocessors and robotics.

Chemical Publishing Co., Inc. *[40]*

80 Eighth Avenue, Department 673, New York, NY 10011
Vendor Type: Private sector firm.
Material Type: Books, publications.
Subjects: Agriculture, culinary arts.
Description: Books on industrial toxicology, chemicals and chemical applications in agriculture and food service.

Chief Automotive Systems, Inc. *[41]*

1924 East 4th Street, Grand Island, NE 68801
Phone: (308) 384-9747
Vendor Type: Private sector firm.
Material Type: Books, audiovisual aids, mechanical equipment, publications, educational media, equipment.

BEST COPY AVAILABLE

Subjects: Autobody, auto mechanics.
Description: Specialized equipment for alignment and repair of collision damaged automobiles.

Chonicle Guidance Publications, Inc. *[42]*

Aurora Street Extension, PO Box 1190, Moravia, NY 13118-1190
Phone: (315) 497-0330
Contact: Marjorie Layton.
Vendor Type: Private sector firm.
Material Type: Books, courseware, publications, computer software.
Subjects: Trade and industrial education, career education.
Description: Computer software for career exploration activities. Also books on career education.

Chown Hardware and Machinery *[43]*

PO Box 2888, Portland, OR 97208
Phone: (800) 452-7634 (Outside Oregon); (800) 547-1930 (Inside Oregon).
Contact: Bruce Smith.
Vendor Type: Private sector firm.
Material Type: Mechanical equipment, hand tools.
Subjects: Woodworking, construction, cabinetmaking.
Description: Complete offering of hand and power tools for woodworking.

Chrysler Motors/Service Training *[44]*

26001 Lawrence Avenue, PO Box 600, Center Line, MI, 48015-9760
Phone: (313) 497-0691
Contact: M.A. Palmer.
Vendor Type: Private sector firm.
Material Type: Books, videotape cassettes, audiotape cassettes, service manuals, teaching guides, publications.
Subjects: Mechanics.
Description: Reference books, videotapes, audio cassettes, service manuals, instructor guides and other related materials for instruction in mechanics.

Coin Educational Products *[45]*

3361 Executive Parkway, Suite 302, Toledo, OH 43606
Phone: (419) 536-5353
Contact: Sherry Brown.
Vendor Type: Private sector firm.
Material Type: Courseware, books, computer software, publications, educational media.
Subjects: Trade and industrial education, career guidance.
Description: Computer software, microfiche, and publications in career guidance.

Computer Integrated Manufacturing *[46]*

1276 Sandhill Drive, PO Box 7317, Ancaster, Ontario, Canada L9G 3N6
Phone: (416) 648-5011
Vendor Type: Private sector firm.
Material Type: Machine tools.
Subjects: Drafting, metals, computers.
Description: Advanced system that uses CAD/CAM techniques for developing and machining prototypes, duplicating models and other steps in bringing a product into production.

Computer Networking Specialists *[47]*

PO Box 20013, Keizer, OR 97307
Phone: (503) 393-3673.
Contact: Larry Hall.
Vendor Type: Private sector firm.
Material Type: Courseware, computer assisted instruction, professional services, computer software, programmed instruction.
Subjects: Trade and industrial education.
Description: Provide services for setting up computer networking systems to deliver instruction.

Conover Company, Ltd. *[48]*

PO Box 155, Omro, WI 54963
Phone: (414) 685-5707
Vendor Type: Private sector firm.
Material Type: Computer assisted instruction, programmed instruction.
Subjects: Electronics, soldering.
Description: Computerized training system for vocational training in electronic assembly and soldering as well as nuts and bolts assembly.

Construction Bookstore, Inc. *[49]*

1830 NE 2d Street, PO Box 2959, Gainesville, FL 32602-2959
Phone: (904) 378-9784
Contact: Susan Purcell.
Vendor Type: Private sector firm.
Material Type: Books, audiovisual aids, publications, educational media.
Subjects: Construction, electricity, plumbing, safety, building codes, building trades.
Description: A wide variety of reference books for the building trades.

Consulab, Inc. *[50]*

415 des Laurentides, Beavport, Quebec, Canada GIC 4R9
Phone: (481) 661-3701
Vendor Type: Private sector firm.
Material Type: Computer assisted instruction, programmed instruction.
Subjects: Electricity.
Description: A microcomputer system for learning electrical theory and practice. Allows on-screen analysis and

display of electrical experiments.

Consumer Electronics Group, Electronic Industries Association [51]

2001 Eye Street, Washington, D.C., 2006
Phone: (202) 457-4919.
Vendor Type: Network.
Material Type: Books, learning modules, videotape cassettes, publications, instructional materials.
Subjects: Electricity, electronics, industrial electronics, radio, televison, cable TV.
Description: A wide array of text and lab manuals, video cassettes and activity booklets for training in basic electricity, electronics, radio and TV.

Consumers Power Company [52]

212 West Michigan Avenue, Jackson, MI 49201-9981
Phone: (517) 788-5803
Contact: G.R. Lester.
Vendor Type: Network.
Material Type: Professional services.
Subjects: Electricity, technical education.
Description: Operate technical training centers and training programs in technical and industrial skills.

Continuing Education Film and Video Library [53]

Portland State University, PO Box 1383, Portland, OR 97207
Phone: (503) 464-4890
Vendor Type: Clearinghouse.
Material Type: Audiovisual aids, films, educational media, nonprint media.
Subjects: Auto mechanics, construction, electronics, food service, hydraulics, industrial mechanics, metals, welding.
Description: Individualized learning modules and various multimedia components, booklets and guides. Topics include auto mechanics, construction, electronics, food service, hydraulics, industrial mechanics, metals and welding.

Coronet/MTI Film & Video [54]

108 Wilmot Road, Deerfield, IL 60015
Phone: (312) 440-1260; (800) 621-2131
Contact: Account Executive.
Vendor Type: Private sector firm.
Material Type: Audiovisual aids, educational media.
Subjects: Allied health.
Description: Film and video for rent or purchase.

CRC Press, Inc. [55]

2000 Corporate Blvd., NW, Boca Raton, FL 33431
Vendor Type: Private sector firm.
Material Type: Books, publications.
Subjects: Allied health.
Description: Scientific books for allied health training.

Creative Learning Systems, Inc. [56]

9889 Hibert Street, Suite E, San Diego, CA 92131
Phone: (619) 566-2880
Contact: Alex Gamboa.
Vendor Type: Private sector firm.
Material Type: Books, courseware, publications, computer software.
Subjects: Pnematics, manufacturing.
Description: Lab system for instructing high technology concepts for preparing students for 21st century.

Curriculum Instructional Materials Center [57]

1500 West Seventh, Stillwater, OK 74074-4364
Phone: (800) 654-4502
Contact: Bob Patton.
Vendor Type: Network.
Material Type: Instructional materials, educational media.
Subjects: Agriculture, office education, marketing, allied health, electricity, mechanics, construction, metals.
Description: A comprehensive offering of competency based curriculum that includes teacher and student materials, transparency master, tests and job sheets.

Curriculum Publications Clearinghouse [58]

Western Illinois University, Harrabin Hall 46, Macomb, IL 61455
Phone: (309) 298-1917
Contact: F. Gene Miller.
Vendor Type: Clearinghouse.
Material Type: Curriculum guides.
Subjects: Construction, culinary arts, graphics, electricity, metals, mechanics.
Description: V-Techs materials that include worker tasks, tools and equipment, standards of competency and units of instruction for a large number of specific jobs.

Damon Instructional Systems [59]

80 Wilson Way, Westwood, MA 02090-9990
Phone: (617) 329-4300
Vendor Type: Private sector firm.
Material Type: Professional services.
Subjects: Allied health.
Description: Applied learning system for teaching medical terminology, dental terminology, basic human anatomy and the human skeleton.

Dana Corporation [60]

PO Box 453, Toledo, OH 43612-0453
Contact: School Assistance.

BEST COPY AVAILABLE

Vendor Type: Private sector firm.
Material Type: Audiovisual aids, educational media.
Subjects: Mechanics.
Description: Teaching aids for automotive, diesel, drive train, and fluid power.

Datalink dba Video Professor *[61]*

1536 Cole Blvd., Suite 180, Golden, CO 80401
Phone: (303) 239-9950; (800) 225-7798
Contact: Rob Elliot.
Vendor Type: Private sector firm.
Material Type: Audiovisual aids, videotape cassettes, courseware, educational media, computer software.
Subjects: Trade and industrial education, vocational education.
Description: Instructional video for computer software packages.

DCA Educational Products *[62]*

Keller Church Road, Bedminister, PA 18910
Phone: (215) 295-2841
Contact: Bennett Schultz.
Vendor Type: Private sector firm.
Material Type: Audiovisual aids, filmstrips, video cassettes, transparencies, courseware, educational media, nonprint media, visual aids, computer software.
Subjects: Autobody, auto mechanics, welding, woodworking, construction, electricity, electronics, metal working, plumbing, refrigeration, drafting, computers.
Description: Filmstrips, overhead transparencies, filmstrips, video cassettes and computer software in a wide range of trades training programs.

Delmar Publishers, Inc. *[63]*

2 Computer Drive, West Box 15015, Albany, NY 12212-9984
Phone: (518) 459-1150
Contact: Deborah Ryan.
Vendor Type: Private sector firm.
Material Type: Books, publications.
Subjects: Air conditioning, heating, refrigeration, automotive, diesel, welding, machine tool, drafting, graphics, electricity, electronics, allied health, hospitality trades.
Description: Textbooks and reference books for many trades.

Delta International Machinery Corp. *[64]*

246 Alpha Drive, Pittsburgh, PA 15233
Phone: (412) 963-2400
Contact: Gene Sliga.
Vendor Type: Private sector firm.
Material Type: Books, educational equipment, publications.
Subjects: Machine shop, metal working.
Description: Tools and equipment and printed material for instruction.

Diversified Educational Systems *[65]*

2743 W. 51st Street, Chicago, IL
Phone: (312) 471-9287
Contact: John Michaels.
Vendor Type: Private sector firm.
Material Type: Books, audiovisual aids, educational equipment, publications, educational media.
Subjects: Mechanics, electronics, electricity, metal working.
Description: Technology education in fluid power, mechanical controls.

Dover/Rotary Lift *[66]*

PO Box 30205, Airport Station, Memphis, TN 38130
Phone: (901) 345-2900
Contact: Larry Ray.
Vendor Type: Private sector firm.
Material Type: Books, audiovisual aids, educational equipment, publications, educational media.
Subjects: Mechanics, metal working.
Description: Books, audiovisuals and equipment.

Dynalogic, Inc. *[67]*

325 Chelmsford Street, Lowell, MA 01853
Phone: (800) 431-8009
Vendor Type: Private sector firm.
Material Type: Curriculum guides, instructional media, learning modules, mechanical equipment, educational media, instructional materials.
Subjects: Electricity, electronics.
Description: Complete learning systems for computer system repair and maintenance, electricity, digital electronics and microprocessors.

East Central Curriculum Center *[68]*

Illinois Vocational Curriculum Center, Sangamon State University, F. 2., Springfield, IL 62708
Phone: (217) 786-6375
Contact: Rebecca Douglas.
Vendor Type: Network.
Material Type: Instructional materials, curriculum guides, educational media.
Subjects: Trade and industrial education, vocational education.
Description: One of six centers in the national network for curriculum coordination. Provides curriculum materials on loan basis. Serves Delaware, District of Columbia, Illinois, Indiana, Maryland, Michigan, Minnesota, Ohio, Pennsylvania, Virginia, West Virginia and Wisconsin.

Educational Development Center *[69]*

55 Chapel Street, Newton, MA 02160

Phone: (617) 969-7100
Contact: Katherine Hanson.
Vendor Type: Network.
Material Type: Guides, professional services, reference materials.
Subjects: Sex equity, trade and industrial education.
Description: Publishing center for women's education equity act. Materials provided on request.

E-CHC, Inc. *[70]*

780 Montague Expressway, Suite 601, San Jose, CA 95131
Phone: (408) 922-0303
Vendor Type: Private sector firm.
Material Type: Machine tools.
Subjects: Metal working.
Description: Source for computerized milling machines.

E & L Instruments *[71]*

70 Fulton Terrace, New Haven, CT 06512-1819
Phone: (203) 624-3103
Vendor Type: Private sector firm.
Material Type: Educational equipment.
Subjects: Electronics.
Description: Training programs in electronics technology, digital electronics and computer maintenance.

Electrical Construction and Maintenance *[72]*

1221 Avenue of the Americas, New York, NY 10020
Phone: (212) 512-6162
Vendor Type: Private sector firm.
Material Type: Books, audiotape cassettes, publications.
Subjects: Electricity.
Description: Books and audiotape cassettes for courses in electronic construction and maintenance.

Elenco Electronics *[73]*

150 Carpenter Street, Wheeling, IL 60090
Phone: (312) 541-3800
Contact: Jeffrey Coda.
Vendor Type: Private sector firm.
Material Type: Educational equipment, instructional materials, educational media.
Subjects: Electronics.
Description: Educational kits and equipment for electronics instruction.

Emco Maier *[74]*

2050 Fairwood Avenue, PO Box 07824, Columbus, OH 43207
Phone: (614) 445-8328
Contact: D.R. Jackson.
Vendor Type: Private sector firm.
Material Type: Machine tools, instructional materials, educational media.
Subjects: Metal working, machine shop, drafting, computers.
Description: Training materials for CNC training, CAD/CAM specializing in turning and milling. Student manuals for advanced machining concepts.

Energy Concepts, Inc. *[75]*

7440 North Long Avenue, Skokie, IL 60077
Phone: (312) 283-4422; (800) 621-1247
Contact: Nancy Schreck.
Vendor Type: Private sector firm.
Material Type: Educational equipment.
Subjects: Electricity, electronics.
Description: Technical training systems and equipment for electricity, electronics, microcomputers, industrial electricity and industrial measurement and control.

ESE Instruments *[76]*

516 Westridge, Bozeman, MT 59715
Phone: (406) 587-4383
Contact: Al Beldring.
Vendor Type: Private sector firm.
Material Type: Educational equipment.
Subjects: Electricity, electronics, fiber optics.
Description: Instruments needed for training in fiber optics.

Expertec-Rochester Products Division of General Motors *[77]*

PO Box 1790, Rochester, NY 14692
Phone: (716) 546-9403
Vendor Type: Private sector firm.
Material Type: Videotape cassettes.
Subjects: Automotive, mechanics, auto mechanics.
Description: Videotape cassettes for training and/or upgrading automotive technicians. Full system and emission control products information.

Extension Instruction and Materials Center *[78]*

The University of Texas - Austin, PO Box 7218, Austin, TX 78713-7218
Phone: (512) 471-7716
Contact: Jim Cockrum.
Vendor Type: Clearinghouse.
Material Type: Curriculum, instructional materials, educational media.
Subjects: Allied health, marketing, technical education.
Description: Catalog includes curriculum products for many technical areas.

Federal Emergency Management Agency *[79]*

PO Box 70274, Washington, D.C. 20024

BEST COPY AVAILABLE

Vendor Type: Network.
Material Type: Instructional materials, professional services, guides.
Subjects: Trade and industrial education, vocational education, hazardous materials.
Description: Hazardous materials training programs.

Feedback Inc. *[80]*

620 Springfield Avenue, Berkley Heights, NJ 07922
Phone: (201) 464-5181
Contact: M.J. Lawson.
Vendor Type: Private sector firm.
Material Type: Educational equipment.
Subjects: Electricity, electronics, telecommunications, robotics.
Description: Equipment for electrical, instrumentation and control, electrical machines, electronics, telecommunications, robotics, CNC and other training programs.

Festo Corporation *[81]*

395 Moreland Road, Hauppage, NY 11788
Phone: (516) 435-0800
Vendor Type: Private sector firm.
Material Type: Instructional materials, educational media.
Subjects: Pneumatics, hydraulics, electronics.
Description: Training packages in control technology, pneumatics, electro-pneumatics, hydraulics, electro-hydraulics and programmable logic control.

Films for the Humanities & Science *[82]*

Box 2053, Princeton, NJ 08543
Phone: (609) 452-1128; (800) 257-5126
Vendor Type: Private sector firm.
Material Type: Videotape cassettes.
Subjects: Allied health.
Description: Videotapes for the health science field.

Flexible Furniture Division of MCI *[83]*

323 Acorn Street, Plainwell, MI 49080
Phone: (616) 685-6831.
Contact: Lynn Middlebrook.
Vendor Type: Private sector firm.
Material Type: Educational equipment.
Subjects: Trade and industrial education, shop.
Description: Workbenches for shop instruction.

Fluid Power Pump Division, Parker Hannifin Corporation *[84]*

100 Parker Drive, Ostego, MI 49078
Phone: (616) 694-9411
Contact: Dave Gruss.
Vendor Type: Private sector firm.
Material Type: Instructional materials, laboratory manuals, educational equipment, educational media.
Subjects: Mechanics, hydraulics.
Description: Hydraulic training unit (portable) includes hardware, text, instructor's guide, lab manual and reference material.

Ford Service Publications *[85]*

PO Box 07150, Detroit, MI 48207
Phone: (313) 865-5000 x302
Vendor Type: Private sector firm.
Material Type: Instructional materials, educational media.
Subjects: Mechanics, auto mechanics.
Description: Service training aids, tune-up specifications, instructional materials and student materials for automotive technician training.

Forestry Supplies, Inc. *[86]*

205 West Rankin Street, PO Box 8397, Jackson, MS 39204-0397
Phone: (601) 354-3565
Vendor Type: Private sector firm.
Material Type: Instructional materials, educational media.
Subjects: Forestry, surveying, environmental protection, wood products, mining, meterology, landscaping.
Description: Equipment, training aids and supplies for forestry, surveying, wood products, mining, photogrammetry, meteorology, environmental protection and landscaping.

Garrett Industries, Division of JSJ Corp. *[87]*

State Rd. 4, PO Box 128, Hudson, IN 46747-0128
Phone: (219) 587-3231; (800) 628-1945
Contact: Cindy K. Marsh.
Vendor Type: Private sector firm.
Material Type: Educational equipment.
Subjects: Trade and industrial education, vocational education.
Description: Manufactures audiovisual carts, security cabinets and computer tables.

Gaylord Brothers *[88]*

PO Box 4901, Syracuse, NY 13221-4901
Phone: (800) 448-6160
Vendor Type: Private sector firm.
Material Type: Courseware, educational equipment, computer software.
Subjects: Trade and industrial education, vocational education.
Description: Software, furniture and supplies for the electronic library.

General Motors Product Service Training *[89]*

30501 Van Dyke Avenue, Warren, MI 48090
Phone: (313) 947-9595

Contact: Anthony Plewa.
Vendor Type: Private sector firm.
Material Type: Books, audiovisual aids, mechanical equipment, simulation, publications, educational media.
Subjects: Auto mechanics, automotive, mechanics.
Description: Printed curriculum materials, tools, equipment, and simulators for automotive fuel and ignition training.

Genium Publishing Company *[90]*

Dept. SD8A, 1145 Catalyn Street, Schenectady, NY 12303-1836
Phone: (518) 377-8854
Vendor Type: Private sector firm.
Material Type: Books, publications.
Subjects: Safety, trade and industrial education.
Description: A collection of material safety data sheets in a school materials safety manual.

Glidden Coatings and Resins *[91]*

925 Euclid Avenue, Cleveland, OH 44115
Vendor Type: Private sector firm.
Material Type: Instructional materials, educational media.
Subjects: Construction, painting (industrial arts).
Description: Training guide for a retail paint salesman. Good basic instruction in paints and finishes.

Goodheart-Wilcox *[92]*

123 W. Taft Drive, South Holland, IL 60473
Phone: (312) 333-7200
Contact: Dick Snyder.
Vendor Type: Private sector firm.
Material Type: Books, publications.
Subjects: Construction, electricity, plumbing, metal working, mechanics, autobody, drafting.
Description: Books on carpentry, residential wiring, masonry, plumbing, welding, woodworking, refrigeration and air conditioning, painting, home maintenance, auto mechanics, diesel, small engines, autobody repair, and drafting.

Greene Manufacturing Company *[93]*

3985 Fletcher Road, Chelsea, MI 48118
Phone: (313) 428-8304
Vendor Type: Private sector firm.
Material Type: Mechanical equipment.
Subjects: Welding, electronics, mechanics.
Description: Benches, tables and stands for welding, engine testing and electronics instructions.

Hampden Engineering Corporation *[94]*

PO Box 563, East Longmeadow, MA 01028-0563
Phone: (413) 525-3981
Contact: John Flynn.
Vendor Type: Private sector firm.
Material Type: Educational equipment.
Subjects: Electricity, electronics, air conditioning, diesel, refrigeration, mechanics.
Description: Equipment for apprenticeship training programs including electrical, electronics, digital microprocessing, air conditioning and refrigeration, diesel engines, power systems, and mechanics training.

Harvest Educational Labs *[95]*

73 Pelham Street, Newport, RI 02840
Phone: (401) 846-6580
Contact: Marcia Lindsay.
Vendor Type: Private sector firm.
Material Type: Books, audiovisual aids, courseware, publications, educational media, computer software.
Subjects: Mechanics, allied health, culinary arts, construction.
Description: Filmstrips, occupational resource modules, diskettes, prevocational training kits for automotive, restaurant, hospital and building trades occupations.

Healthkit/Zenith Educational Systems *[96]*

Hilltop Road, PO Box 167, St. Joseph, MO 49085
Phone: (616) 982-3200
Contact: Sue Russell.
Vendor Type: Private sector firm.
Material Type: Books, educational equipment, publications.
Subjects: Electronics, robotics, fiber optics.
Description: Textbooks, workbooks, instructor guides, video material for training in electronics, robotics, fiber optics and related areas.

Hickok Teaching Systems *[97]*

10514 DuPont Avenue, Cleveland, OH 44108
Phone: (216) 541-8060
Contact: Robert W. Frederick.
Vendor Type: Private sector firm.
Material Type: Educational equipment, teaching guides, textbooks, laboratory manuals, instructional materials, publications.
Subjects: Electronics, electricity, mechanics.
Description: Training systems in digital, microcomputers, electronics, communications, instrumentation, automotive fluid power and others.

Hitachi Denshi America, Ltd. *[98]*

14169 Proton Road, Dallas, TX 75244
Phone: (214) 233-7623
Contact: Bob Meehan.
Vendor Type: Private sector firm.
Material Type: Educational equipment.
Subjects: Electronics.
Description: Manufactures oscillioscopes.

BEST COPY AVAILABLE

IAP Inc. *[99]*
PO Box 10000, Casper, WY 82602
Phone: (800) 443-9250
Contact: Jim Williams.
Vendor Type: Network.
Material Type: Books, audiovisual aids, publications, educational media.
Subjects: Aviation mechanics, truck driving.
Description: Aviation maintenance textbooks and audiovisual programs as well as basic tractor-trailer driving manuals.

Industrial Press, Inc. *[100]*
Department 8612, 200 Madison Avenue, New York, NY 10016
Vendor Type: Private sector firm.
Material Type: Books, publications.
Subjects: Metal working, machine tools, welding.
Description: Publishes machinery handbook and many other industrial publications.

Industrial Training Corporation *[101]*
13515 Dulles Technology Drive, Herndon, VA 22071
Phone: (703) 471-1414; (800) 638-3757
Fax Number: (703) 471-1414
Contact: Joanne Surette.
Vendor Type: Private sector firm.
Material Type: Videotape cassettes, professional services.
Subjects: Air conditioning, refrigeration, electricity, heavy equipment operation, hydraulics, mechanics, pipefitting.
Description: Has a large library of videotape cassettes in specialized training areas.

Instructional Materials Laboratory *[102]*
University of Missouri, 908 Woodson Way, Columbia, MO 65211
Phone: (314) 882-9616
Contact: Amon Herd.
Vendor Type: Clearinghouse.
Material Type: Books, audiovisual aids, publications, educational media.
Subjects: Trade and industrial education, vocational education.
Description: Comprehensive offering of vocational instructional materials. Small engine repair series is especially well developed.

Instructional Materials Laboratory *[103]*
Ohio State University, 154 West 12th Avenue, Columbus, OH 43210-1302
Phone: (614) 422-5001
Vendor Type: Clearinghouse.
Material Type: Instructional materials, educational media.
Subjects: Trade and industrial education, vocational education.
Description: Comprehensive collection of vocational instructional materials.

Instructional Materials Service *[104]*
Pennsylvania State University, 13A Armsby Building, University Park, PA 16802
Phone: (814) 863-3824
Contact: William Williams.
Vendor Type: Clearinghouse.
Material Type: Books, publications.
Subjects: Trade and industrial education.
Description: Books, guides and other publications for a wide variety of trades.

Instructional Materials Service *[105]*
Texas A & M University, FE Box 2588, College Station, TX 77843-2588
Phone: (409) 845-6601
Contact: Bill Tomlinson.
Vendor Type: Clearinghouse.
Material Type: Books, audiovisual aids, publications, educational media.
Subjects: Mechanics, construction, electronics, graphics.
Description: Course outlines, competency lists, student progress records and other materials for mechanics, construction, electronics and graphics training programs.

Intertec Publishing Corp *[106]*
PO Box 12901, 9221 Quiuiri, Overland Park, KS 66212
Phone: (913) 541-6635
Contact: Joan Nelthorpe; Liz Hooker.
Vendor Type: Private sector firm.
Material Type: Books, publications.
Subjects: Mechanics, small engine repair.
Description: Service manuals for tractors, bicycles, RV's, small engines, chain saws, lawn mowers, AC generators, boats, outboard motors, inboard motors and rotary tillers.

Janus Book Publishers, Inc. *[107]*
2501 Industrial Way, Hayward, CA 94545
Phone: (415) 887-7070
Contact: Jane Brundage.
Vendor Type: Private sector firm.
Material Type: Instructional materials, educational media.
Subjects: Welding, English (second language).
Description: Teacher's guide and student book for welding written specifically for English as a second language students to develop entry level welding skills and vocabulary.

Jist Works, Inc. *[108]*
720 N. Park Avenue, Indianapolis, IN 46202

Phone: (317) 637-6643; (800) 648-5478
Contact: Ruth Lister.
Vendor Type: Private sector firm.
Material Type: Books, audiovisual aids, videotape cassettes, courseware, publications, educational media, computer software.
Subjects: Trade and industrial education, career education.
Description: Career planning and job search system.

Job Corps *[109]*

200 Constitution Avenue, Washington, D.C. 20210
Phone: (202) 535-0559
Contact: Dr. Michael Murphy.
Vendor Type: Network.
Material Type: Books, publications.
Subjects: Trade and industrial education.
Description: Publications and printed curriculum materials from Job Corps training programs.

John Deere & Company *[110]*

John Deere Road, Moline, IL 61265-8098
Phone: (309) 757-5903
Contact: Annete Lacour.
Vendor Type: Private sector firm.
Material Type: Books, slides, instructional materials, videotape cassettes, publications, transparencies, educational media.
Subjects: Mechanics, agriculture.
Description: Texts, slide sets, films, videotapes, transparency masters, and workbooks on fundamentals of service of engines and implements; fundamentals of machine operation; machinery maintenance; and machinery management.

Ken Cook Education Systems *[111]*

12855 W. Silver Spring Drive, PO Box 207, Butler, WI 53007
Phone: (414) 466-6060
Contact: Carol Storch.
Vendor Type: Private sector firm.
Material Type: Educational equipment, hand tools, teaching methods, instructional materials, individualized instruction, educational media.
Subjects: Mechanics, welding, blueprints, basic reading, employment skills, small engine repair.
Description: Automated individualized instruction in a self-contained student console workstation. Includes equipment, tools, workbooks and related study materials. Programs in small engines, diesel generators, welding and blueprint reading.

Kentucky Department of Education *[112]*

2024 Capitol Plaza Tower, Frankfort, KY 40601
Phone: (502) 564-2890
Vendor Type: Clearinghouse.
Material Type: Instructional materials, educational media.
Subjects: Trade and industrial education, vocational education.
Description: Comprehensive offering of vocational curriculum.

Knight Electronics *[113]*

10940 Alder Circle, Dallas, TX 75238
Phone: (214) 340-0265
Contact: David Luna.
Vendor Type: Private sector firm.
Material Type: Educational equipment, instructional materials, educational media.
Subjects: Electronics.
Description: Electronic laboratory equipment and supplies for technical training institutions.

Lab-Volt Systems *[114]*

PO Box 686, Farmingdale, NJ 07727
Phone: (201) 938-2000; (800) 223-1057
Contact: Daryl Dayton.
Vendor Type: Private sector firm.
Material Type: Books, audiovisual aids, educational equipment, publications, educational media.
Subjects: Electronics.
Description: Technical training systems and instructional materials for electronics training programs.

Lenco, Inc. *[115]*

319 W. Main Street, PO Box 348, Jackson, MO 63755
Phone: (314) 243-3141
Contact: Gary Enderle.
Vendor Type: Private sector firm.
Material Type: Simulation, educational equipment.
Subjects: Welding.
Description: The weld-trainer is a high-tech, computer controlled unit that allows simulations of various welding conditions.

Lennox Educational Products *[116]*

315 Murfreesboro Street, Mufreesboro, TN 37130
Phone: (615) 896-5410
Contact: Dana Koverman.
Vendor Type: Private sector firm.
Material Type: Books, audiovisual aids, educational equipment, publications, educational media.
Subjects: Electronics, air conditioning, electricity, robotics, energy.
Description: Complete training program packages for technicians in air conditioning, solar service, electricians, robotics, automated controls and energy management.

Light Machines Corporation *[117]*

BEST COPY AVAILABLE

669 E. Industrial Drive, Manchester, NH 03103
Phone: (603) 625-8600
Vendor Type: Private sector firm.
Material Type: Educational equipment.
Subjects: Drafting, machine shop, manufacturing, computers.
Description: Precision, small machine for teaching CNC with software for CAD/CAM/CNC.

Lincoln Technical Institute *[118]*

1301 Stadium Drive, Indianopolis, IN 46202
Phone: (317) 633-9929
Contact: James McGuire.
Vendor Type: Private sector firm.
Material Type: Instructional materials, educational media.
Subjects: Mechanics, automotive.
Description: Training courses in automotive technology.

L.J. Electronics, Inc. *[119]*

1886 Larchwood, Troy, MI 48083
Phone: (800) 237-3482
Contact: Paul Ward.
Vendor Type: Private sector firm.
Material Type: Educational equipment, instructional materials, educational media.
Subjects: Electronics, manufacturing.
Description: Technical teaching systems as individual components and complete packages. Topics include microprocessors, microcomputers, control industrial devices, DC motor control, programmable controllers, digital communications, robotics and industrial automation.

The L.S. Starrett Company *[120]*

121 Crescent Street, Athol, MA 01331
Phone: (617) 249-3551 x222
Contact: Bruce K. Fowler.
Vendor Type: Private sector firm.
Material Type: Books, audiovisual aids, publications, educational media, videotape cassettes.
Subjects: Machine shop, tool and die.
Description: Publications, buying guides, and videotape cassettes for machine tool trades. Many free materials on request.

McEnglevan Heat and Manufacturing Company *[121]*

700 Griggs Street, PO Box 31, Danville, IL 61834-0031
Phone: (217) 446-0941
Vendor Type: Private sector firm.
Material Type: Educational equipment, mechanical equipment.
Subjects: Machine shop, machine tools, foundry, diemaking.
Description: Equipment for tool and diemaker training as well as foundry training programs.

McGraw Hill Training System *[122]*

PO Box 641, Del Mar, CA 92014-9988
Phone: (800) 421-0833
Vendor Type: Private sector firm.
Material Type: Films, videotape cassettes, mass media, nonprint media, visual aids.
Subjects: Trade and industrial education.
Description: Films and videos for teaching communications, motivation and customer service.

Marshall Maintenance *[123]*

525 South Clinton Avenue, Trenton, NJ 08611
Phone: (609) 394-7153
Vendor Type: Private sector firm.
Material Type: Videotape cassettes.
Subjects: Mechanics, welding, pipefitting, machine shop, metal working.
Description: Video and training films for millwrights, welders, pipefitters and machinists.

Masonry Institute of America *[124]*

2550 Beverley Blvd, Los Angeles, CA 90057
Phone: (213) 388-0472
Vendor Type: Clearinghouse.
Material Type: Books, films, publications, mass media, nonprint media.
Subjects: Construction, masonry.
Description: Directory of masonry publications and films.

Masonry Speciality Company *[125]*

4430 Gibsonia Road, Rt. 910, Gibsonia, PA 15044
Phone: (412) 443-7080
Vendor Type: Private sector firm.
Material Type: Filmstrips, transparencies, tools, educational equipment, educational media.
Subjects: Masonry, construction, carpentry, bricklaying.
Description: Filmstrips, transparencies, slides, apprentice tool kits and equipment for masonry, bricklaying and carpentry trades.

MATC CAD *[126]*

1015 N. Sixth Street, Milwaukee, WI 53203
Phone: (414) 278-6743
Contact: Gail Nuessmeier.
Vendor Type: Private sector firm.
Material Type: Courseware, computer assisted instruction, computer uses in education, computer software.
Subjects: Drafting.
Description: Software for computer aided drafting.

Mechtec *[127]*

39 Stoughton Road, Dedham, MA 02026

Phone: (617) 329-7538
Contact: Brenda Streblow.
Vendor Type: Private sector firm.
Material Type: Instructional materials, guides, educational media, reference materials.
Subjects: Mechanics, pipefitting.
Description: Troubleshooting guides for centrifual air compressors, reciprocating air compressors, U-belts and boiler feed pumps. Alignment data sheets for aligning rotating machinery.

Medical Plastics Lab., Inc. *[128]*

PO Box 38, Gatesville, TX 76528
Phone: (817) 865-7221
Contact: Gail Rockwell.
Vendor Type: Private sector firm.
Material Type: Simulations.
Subjects: Allied health.
Description: Anatomical models and patient simulators.

Mega-Technologies *[129]*

29 Cook Street, Bellerca, MA 01866
Phone: (617) 273-1900
Vendor Type: Private sector firm.
Material Type: Educational equipment, instructional materials, simulations, competency based materials, educational media.
Subjects: Mechanics, hydraulics, energy, small engine repair, diesel.
Description: Complete training programs related to transportation equipment. Includes small engines, diesel, automotive, hydraulics and energy programs. All modules are competency based.

Meridian Education Corporation *[130]*

205 East Locust Street, Bloomington, IL 61701
Phone: (309) 827-5745
Contact: Joann Amore.
Vendor Type: Private sector firm.
Material Type: Filmstrips, slides, videotape cassettes, courseware, books, nonprint media, transparencies, publications.
Subjects: Autobody, welding, metal working, electronics, woodworking, robotics, computers.
Description: Filmstrips, slides, videos, interactive video, computer software and books. Subjects include robotics, CAD/CAM, welding, woodworking, autobody, electronics, safety, soldering, metrics, metalwork, solar energy, and graphic arts.

Merrill Publishing Company *[131]*

1300 Alum Creek Drive, Box 508, Columbus, OH 43216
Phone: (614) 890-1111
Vendor Type: Private sector firm.
Material Type: Books, instructional materials, publications, educational media.
Subjects: Electricity, electronics, drafting, mechanics.
Description: Texts and lab manuals for electricity, electronics, drafting, and fluid mechanics.

Mid-America Vocational Curriculum Consortium *[132]*

1500 West Seventh Avenue, Stillwater, OK 74074-4364
Phone: (405) 377-2000
Contact: Bob Patton.
Vendor Type: Private sector firm.
Material Type: Teaching guides, learning modules, courseware, educational media, computer software.
Subjects: Culinary Arts, allied health, graphics, mechanics, air conditioning, refrigeration, electronics. Agriculture.
Description: Competency based vocational curriculum materials developed by the eleven states of the consortium.

Mid-States Hydraulics, Inc. *[133]*

7909 Lake Road, Medford, WI 54451
Phone: (715) 785-7335
Contact: Jim M. Gummerson.
Vendor Type: Private sector firm.
Material Type: Books, audiovisual aids, professional seminars, educational equipment, publications, educational media.
Subjects: Mechanics, hydraulics.
Description: Printed curriculum materials, tools and equipment and on-site seminars for training in hydraulics.

Modern School Supplies *[134]*

PO Box 958, Hartford, CT 06143
Phone: (800) 243-2329
Contact: Dorance H. Firzsimonds.
Vendor Type: Private sector firm.
Material Type: Instructional materials, educational media.
Subjects: Graphics, drafting.
Description: Instructional supplies and equipment for art, graphics and drafting.

NAPA Hand Service Tools *[135]*

28124 197th Avenue, SE, Kent, WA 98042
Phone: (206) 636-4648
Contact: Sheryl Blome.
Vendor Type: Private sector firm.
Material Type: Hand tools.
Subjects: Mechanics.
Description: Hand/service tools.

NASCO *[136]*

901 Janesville Avenue, Ft. Atkinson, WI 53538
Phone: (414) 563-2446

BEST COPY AVAILABLE

Vendor Type: Private sector firm.
Material Type: Audiovisual aids, educational equipment, educational media.
Subjects: Culinary arts, allied health.
Description: NASCO Home Economics Catalog is a catalog of equipment and instructional aids for culinary arts training. NASCO Health Care Educational Materials is a catalog of equipment and instructional aids for allied health training.

National Archives & Records Administration *[137]*

8700 Edgeworth Drive, Capitol Heights, MD 20743-3701
Phone: (800) 638-1300
Vendor Type: Clearinghouse.
Material Type: Videotape cassettes, films, mass media.
Subjects: Trade and industrial education, vocational education.
Description: Features more than 2,700 videotapes, films and multimedia kits on a wide range of technical subjects.

National Association of Plumbing, Heating & Cooling *[138]*

PO Box 6808, Falls Church, VA 22046
Phone: (703) 237-8100; (800) 533-7694
Contact: Jim McInis.
Vendor Type: Network.
Material Type: Books, audiovisual aids, publications, educational media.
Subjects: Plumbing, air conditioning, heating.
Description: Approved course outline and standards, lesson plans and student workbooks for apprentice training. Also included is the National Standard Plumbing Code - Illustrated, safety manual and videotapes.

National Audio-Visual Center *[139]*

8700 Edgeworth Drive, Capitol Heights, MD 20743-3701
Vendor Type: Private sector firm.
Material Type: Films, videotape cassettes, mass media, nonprint media.
Subjects: Trade and industrial education.
Description: Media Resource Catalog is a listing of over 2,700 titles in video cassettes, films and multimedia kits on general topics and specific trades training.

National Center for Research in Vocational Education *[140]*

1960 Kenney Road, Box U, Columbus, OH 43210-1090
Phone: (614) 486-3655
Contact: Judy Cohen.
Vendor Type: Network.
Material Type: Books, publications, curriculum guides.
Subjects: Trade and industrial education, vocational education.
Description: Comprehensive offering of vocational instructional materials. Apprenticeship Lessons from Abroad includes practical ideas, projects and innovations from 18 industrialized nations with market economies. Product Catalog provides a complete listing of products and services for professionals in employment-related education and training.

National Computer Products *[141]*

138 S. Pennyslvania Avenue, PO Box 61, Morrisville, PA 19067
Phone: (800) EDU-SAVE
Vendor Type: Private sector firm.
Material Type: Courseware, computer software.
Subjects: Trade and industrial education, vocational education.
Description: Software Sourcebook includes software for vocational training programs.

National Concrete Masonry Association *[142]*

3202 Horse Pen Road, PO Box 781, Herndon, VA 22070
Phone: (703) 435-4900
Vendor Type: Network.
Material Type: Instructional materials, educational media.
Subjects: Construction, masonry, bricklaying.
Description: A variety of training manuals, videotapes and student information on masonry and bricklaying.

National Council for Resource Development *[143]*

Suite 410, One DuPont Circle, NW, Washington, D.C. 20036-1176
Vendor Type: Network.
Material Type: Information, professional services.
Subjects: Trade and industrial education, vocational education.
Description: An affiliate of the American Association of Community and Junior Colleges. Provides networking of information between member colleges.

National Fire Protection Association *[144]*

Batterymarch Park, Quincy, MA
Vendor Type: Network.
Material Type: Guides, reference materials.
Subjects: Trade and industrial education.
Description: NFPA 110 Emergency and Standby Power Systems are standards established by the NFPA.

National Glass Association *[145]*

8200 Greensboro Drive, McLean, VA 22102
Phone: (703) 442-4890
Contact: Carolyn Blomdahl.
Vendor Type: Network.

Material Type: Instructional materials, videotape cassettes, educational media.
Subjects: Drafting, construction, mechanics.
Description: Manuals, instructor workbooks and video training tapes for architectural and auto glass installation training programs.

National Occupational Competency Institute *[146]*

Bishop 409, Ferris State University, Big Rapids, MI 49307
Phone: (616) 592-3657
Contact: Robert Manley.
Vendor Type: Network.
Material Type: Tests, measures.
Subjects: Trade and industrial education, journeymen.
Description: Industrial occupational competency testing system for testing journeymen equivalent skills.

National Publishers of the Black Hills, Inc. *[147]*

Box 288, Rapid City, SD 57709
Phone: (800) 843-8892
Vendor Type: Private sector firm.
Material Type: Books, publications, textbooks.
Subjects: Allied health, tourism, computer programming.
Description: Textbooks for training programs in travel and tourism, medical assisting and computer programming.

NCLC Consortium for Experimental Cooperative Education *[148]*

1501 Broadway, New York, NY 10036
Phone: (212) 840-1801
Contact: Solomon Huberman.
Vendor Type: Network.
Material Type: Research reports, professional services.
Subjects: Trade and industrial education, cooperative education.
Description: Research and assistance in linking cooperative education and apprenticeship.

NIDA Corporation *[149]*

776 Cove Road, Stamford, CT 06902
Phone: (203) 327-9450
Vendor Type: Private sector firm.
Material Type: Computer assisted instruction, programmed instruction.
Subjects: Electronics.
Description: Computer assisted instruction system for electronic technicians.

Nilfisk of America, Inc. *[150]*

300 Technology Drive, Maluexi, PA 19355
Phone: (215) 647-6420
Contact: Renee A. Romano.
Vendor Type: Private sector firm.
Material Type: Videotape cassettes.
Subjects: Mechanics.
Description: Videotape on aesbestos clean brake cleaning system.

Northeast Curriculum Coordination Center, New Jersey *[151]*

Vocational Education Resource Center, Cambridge Park School, Crestway, Aberdeen, NJ 07747
Phone: (201) 390-1191
Contact: Martha Posci.
Vendor Type: Network.
Material Type: Instructional materials, curriculum guides, educational media.
Subjects: Trade and industrial education, vocational education.
Description: One of six centers in the national network for curriculum coordination. Provides curriculum materials on loan basis. Serves Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Puerto Rico, Rhode Island and Vermont.

Northwest Curriculum Coordination Center *[152]*

St. Martins College, Lacey, WA 98503
Phone: (206) 438-4456
Contact: Bill Daniels; Judy Noll.
Vendor Type: Network.
Material Type: Books, curriculum guides, publications.
Subjects: Trade and industrial education, vocational education.
Description: The Northwest Center is one of six centers that provide curriculum materials on a loan basis. Serves Alaska, Colorado, Idaho, Montana, North Dakota, Oregon, South Dakota, Utah, Washington, and Wyoming.

NW Regional Educational Laboratory *[153]*

300 SW Sixth Avenue, Portland, OR 97204
Phone: (503) 248-6800
Vendor Type: Network.
Material Type: Books, publications.
Subjects: Trade and industrial education, computers, adult education.
Description: Textbooks on computer technology and adult basic education.

NUS Training Corporation *[154]*

910 Clopper Road, Gathersburg, MD 20878
Phone: (301) 258-2500; (800) 848-1717
Contact: R. Keith Giarman.
Vendor Type: Private sector firm.
Material Type: Textbooks, audiovisual aids, videotape cassettes, publications, educational media.

BEST COPY AVAILABLE

Subjects: Mechanics, electricity, refinery operations, chemical operations.
Description: Complete video-based training programs in general and mechanical maintenance, electrical maintenance, instrumentation and control, microcomputers, refinery operations, electrical transmission and distribution and chemical operations.

Oklahoma Department of Vocational and Technical Education *[155]*

1500 West 7th, Stillwater, OK 74074
Phone: (405) 377-2000
Contact: Kathleen Kincaid.
Vendor Type: Network.
Material Type: Books, audiovisuals, curriculum guides, publications, educational media.
Subjects: Trade and industrial education, mechanics, construction, allied health, agriculture.
Description: Instructional materials on the automotive, welding, carpentry, health and agriculture areas.

Opportunities for Learning, Inc. *[156]*

20417 Nordhoff St., Dept. 4HA, Chatsworth, CA 91311
Phone: (818) 341-2535
Vendor Type: Private sector firm.
Material Type: Instructional materials, educational media.
Subjects: Trade and industrial education.
Description: Instructional materials for basic skill development.

PACE, Inc. *[157]*

9893 A Brewers Ct., Laurel, MD 20707
Phone: (301) 490-9860
Contact: Marc W. Siegel.
Vendor Type: Private sector firm.
Material Type: Books, audiovisual aids, educational equipment, publications, educational media.
Subjects: Electronics.
Description: Electronics training systems.

Paxton/Patterson *[158]*

5719 W. 65th Street, Chicago, IL 60638
Phone: (800) 323-8484
Contact: Raylene LaFaire.
Vendor Type: Private sector firm.
Material Type: Educational equipment, instructional materials, educational media.
Subjects: Trade and industrial education.
Description: Instructional equipment, tools and supplies for vocational education programs.

PICA Foundation *[159]*

4651 Charlotte Park Drive, Suite 120, PO Box 11176, Charlotte, NC 28220
Phone: (704) 527-7422
Vendor Type: Private sector firm.
Material Type: Individualized instruction, instructional materials, teaching methods, educational media.
Subjects: Graphics.
Description: A complete graphic communications education program based on self-instruction.

Piney Mountain Press, Inc. *[160]*

PO Box 333, Cleveland, GA 30528
Phone: (404) 864-7180
Contact: Cliff Rice.
Vendor Type: Private sector firm.
Material Type: Tests, measures.
Subjects: Trade and industrial education.
Description: Vocational competency management system to assist instructors in assessing competency levels and documenting progress.

Point Control Company *[161]*

372 West 12th Avenue, Suite 6, Eugene, OR 97401
Phone: (503) 344-4470
Contact: Steve Brouse.
Vendor Type: Private sector firm.
Material Type: Computer assisted instruction, programmed instruction.
Subjects: Machine tools, machine shop.
Description: Advanced CNC graphic programming systems for mills, lathes, and punches.

Portland Millmen and Cabinetmakers *[162]*

2205 N. Lombard, Room 102, Portland, OR 97217
Vendor Type: Network.
Material Type: Learning modules, individualized instruction, instructional materials, teaching methods.
Subjects: Cabinetmaking, millmen.
Description: Competency based curriculum for cabinetmakers and millmen apprenticeship.

Prentice-Hall Media *[163]*

150 White Plaines Road, Tarrytown, NY 10591
Vendor Type: Private sector firm.
Material Type: Audiovisual aids, educational media.
Subjects: Construction, carpentry, plumbing, electricity.
Description: Audiovisual programs on basic carpentry, plumbing and electrical systems.

The Printing Industry of the Carolinas *[164]*

PO Box 11176, Charlotte, NC 28220
Phone: (704) 527-7422
Contact: Tom Brennan.
Vendor Type: Network.
Material Type: Books, audiovisual aids, publications, educational media.

Subjects: Graphics.
Description: Publications and audiovisual aids for instruction in the printing trades.

Professional Publications, Inc. *[165]*

PO Box 199, San Carlos, CA 94070
Phone: (415) 593-9119
Contact: Wendy Nelson.
Vendor Type: Private sector firm.
Material Type: Books, publications.
Subjects: Engineering.
Description: Engineering textbooks written primarily for engineers taking the state engineering licensing exams.

Provincial Post-Secondary Resource *[166]*

Ministry of Advanced Education, Parliament Building, Victoria, BC, Canada VBV 1X4.
Phone: (604) 387-6173
Vendor Type: Network.
Material Type: Guides, instructional materials, learning modules, reference material, educational media, instructional materials.
Subjects: Trade and industrial education, vocational education.
Description: Course outlines, manuals, handbooks, informational booklets and learning guides on a wide range of technical subjects.

PSI Systems Corporation *[167]*

PO Box 21, Pittsburg, KS 66762
Phone: (800) 351-9121
Contact: Phil Boatright.
Vendor Type: Private sector firm.
Material Type: Mechanical equipment, instructional materials, educational media.
Subjects: Drafting, manufacturing, machine shop.
Description: CAD/CAM training systems.

Quill Hair & Ferrule, Ltd. *[168]*

PO Box 21, Mokena, IL 60448-0021
Phone: (312) 479-9383
Contact: Peter Miller.
Vendor Type: Private sector firm.
Material Type: Instructional materials, educational media.
Subjects: Graphics.
Description: Equipment and supplies for sign painting, commerical lettering and gold leafing.

Racz Publishing Company *[169]*

2250 E. Tropicana Avenue, Suite 19345, Las Vegas, NV 89119
Phone: (702) 795-8922
Vendor Type: Private sector firm.
Material Type: Books, videotape cassettes, publications.
Subjects: Mechanics.
Description: Book and videotapes on carburetor repair and troubleshooting.

The Richen Corporation *[170]*

8323 Southwest Freeway, Suite 837, Houston, TX 77074
Phone: (713) 778-0101
Contact: Richard Fairman.
Vendor Type: Private sector firm.
Material Type: Educational equipment.
Subjects: Electronics.
Description: A Modular Training System (MTS) with 24 powered locations, a collection of plug-in modules and a module power supply. Students can build, study and troubleshoot digital and analog circuits on the system.

Rhino Robots, Inc. *[171]*

308 South State Street, PO Box 4010, Champaign, IL 61820
Phone: (217) 352-8485
Vendor Type: Private sector firm.
Material Type: Simulation, mechanical equipment.
Subjects: Robotics, electronics.
Description: An integrated high-tech robotic system for education, research and training.

RMI Media Productions, Inc. *[172]*

2807 West 47th Street, Shawnee Mission, KS 66205
Phone: (913) 262-3974; (800) 821-5480
Contact: David L. Little.
Vendor Type: Private sector firm.
Material Type: Videotape cassettes, instructional materials, educational media.
Subjects: Trade and industrial education, vocational education.
Description: Over 1200 videos in a wide range of general and technical subjects.

Roll-In-Saw *[173]*

4830 Briar Road, Cleveland, OH 44135
Phone: (216) 433-1920
Contact: Ron Kizzer.
Vendor Type: Private sector firm.
Material Type: Mechanical equipment.
Subjects: Construction.
Description: Vertical bandsaw.

The Roofing Industry Educational Institute *[174]*

7006 South Alton Way, #B, Englewood, CO 80112-2003
Phone: (303) 770-0613
Vendor Type: Network.
Material Type: Seminars.
Subjects: Construction.
Description: Offers one to four day seminars for roofers.

BEST COPY AVAILABLE

Seminars include topics on design, material selection, construction, quality control and maintenance of roofing systems.

SAE/Engineering Resource for Advanced Mobility *[175]*

400 Commonwealth Drive, Department 2037, Warrendale, PA 15096-0001
Phone: (412) 776-4970
Contact: Customer Service.
Vendor Type: Network.
Material Type: Books, publications.
Subjects: Safety, mechanics.
Description: Books on a variety of trade areas including auto mechanics, electronics, and robotics.

Safety Rules, Inc. *[176]*

3727 Joan Drive, Waterloo, IA 50702
Phone: (800) 641-5466
Vendor Type: Private sector firm.
Material Type: Instructional materials, educational media.
Subjects: Safety, trade and industrial education.
Description: Full line of safety signs and products for school and industry.

Safronek Enterprises, Inc. *[177]*

4005 El Camino Real, Atascadero, CA 93422
Phone: (805) 466-1563
Contact: Ellen Safronek.
Vendor Type: Private sector firm.
Material Type: Mechanical equipment.
Subjects: Cabinetmaking, construction.
Description: Equipment for custom manufacture of kitchen cabinets, bank and store fixtures, displays, institutional furniture and plastic fabrications.

Sears Contract Sales *[178]*

PO Box 3944, Seattle, WA 98124
Phone: (206) 223-9624
Contact: D. Olsen.
Vendor Type: Private sector firm.
Material Type: Hand tools, educational equipment.
Subjects: Trade and industrial education, vocational education.
Description: Assortment of tools and equipment for industrial trades.

Shain/Shopbuilt, Inc. *[179]*

509 Hemlock Street, Philipsburg, PA 16866
Phone: (814) 342-2820
Contact: Ron Pimentel.
Vendor Type: Private sector firm.
Material Type: Furniture, classroom furniture.
Subjects: Drafting, computers.
Description: Drafting and computer furniture.

Sierra Micro Applications *[180]*

8125 Sunset Avenue, Suite 101, Fair Oaks, CA 95628
Phone: (916) 722-5018
Contact: Ben LaPolla.
Vendor Type: Private sector firm.
Material Type: Information systems, management systems.
Subjects: Trade and industrial education, computers.
Description: Computer-based apprenticeship training information system. This is a database management tool for the training office.

Sign Knowledge Corporation *[181]*

PO Box 21, Makena, IL 60448-0021
Phone: (312) 479-9383
Contact: Peter Millar.
Vendor Type: Private sector firm.
Material Type: Videotape cassettes.
Subjects: Graphics.
Description: Videotapes in the field of sign painting, commercial lettering, gold leaf, sandblasting, etc.

The Singer Company *[182]*

80 Commerce Drive, Rochester, NY 14623
Phone: (609) 424-4646
Contact: Jim Schultz.
Vendor Type: Private sector firm.
Material Type: Tests, instructional materials, measures, educational media.
Subjects: Trade and industrial education.
Description: Skills orientation programs containing filmstrips, audiotapes, lesson plans, student activity sheets and program summary card, vocational evaluation system for hands-on assessment of interests, aptitudes and abilities.

Southeast Curriculum Coordination Center. *[183]*

Mississippi State University, PO Drawer DX, Mississippi State, MS 39762
Phone: (601) 325-2510
Contact: Jimmy McCally.
Vendor Type: Network.
Material Type: Instructional materials, books, educational media, publications.
Subjects: Trade and industrial education, vocational education.
Description: One of six centers in the national network for curriculum coordination. Publications available on a loan basis. Serves Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina and Tennessee.

Southwestern Publishing Company *[184]*
5101 Madison Road, Cincinnati, OH 45227
Contact: Don Fox.
Vendor Type: Private sector firm.
Material Type: Textbooks, guides, books, reference materials.
Subjects: Mechanics, auto mechanics.
Description: Auto Mechanics, Theory and Practice is a textbook and shop service manual for a comprehensive learning program.

Stratus Productions *[185]*
PO Box 8918, Salt Lake City, UT 84108
Phone: (801) 238-4032
Vendor Type: Private sector firm.
Material Type: Videotape cassettes.
Subjects: Construction, masonry.
Description: Video training tapes for the trowel trades, bricklaying, cement finishing and tilesetting.

Structural Engineers Association of Southern California *[186]*
2550 Beverly Blvd, Los Angeles, CA 90057
Phone: (213) 385-4424
Vendor Type: Network.
Material Type: Directories, reference materials.
Subjects: Construction, drafting.
Description: Directory of Publications contains design standards, engineering services and technical papers in structural engineering.

Systems Research and Development Corporation *[187]*
PO Box 12221, Research Triangle Park, NC 27709
Phone: (919) 544-1730
Contact: Cathy McCall.
Vendor Type: Private sector firm.
Material Type: Guides, instructional materials, workbooks, courseware, reference materials, educational media, computer software.
Subjects: Mechanics.
Description: Repair, maintenance, management curriculum with real business applications. Includes an educator's guide, student workbook and software.

T-11 Robotics Systems, Inc. *[188]*
631 South Vermont Street, Pulatine, IL 60067
Phone: (312) 991-2636
Vendor Type: Private sector firm.
Material Type: Educational equipment, courseware, instructional materials, computer software, educational media.
Subjects: Electronics, robotics.
Description: Training programs in robotics in automated manufacturing and industrial controls. Includes equipment, manuals and software.

Tandy Leather Company *[189]*
1400 Everman Pkwy, Ft. Worth, TX 76140
Phone: (817) 551-9778
Contact: George Hurst.
Vendor Type: Private sector firm.
Material Type: Books, audiovisual aids, educational equipment, instructional materials, publications, educational media.
Subjects: Trade and industrial education, leatherworking.
Description: Publications, audiovisual aids, tools and supplies for leatherworking.

Teaching Aids, Inc. *[190]*
PO Box 1798, Costa Mesa, CA 92628-0798
Phone: (714) 548-9321
Contact: Gene Ray.
Vendor Type: Private sector firm.
Material Type: Books, audiovisual aids, courseware, publications, educational media, computer software.
Subjects: Auto mechanics, diesel mechanics, autobody, metal working, small engine repair, mechanics.
Description: Automotive Technology Catalog lists books, videos, filmstrips, and program guides on auto, diesel, autobody, small engine and heavy duty mechanics training programs.

Technovate, Inc. *[191]*
910 SW 12th Avenue, Pompano, FL 33069
Phone: (305) 946-4470
Contact: Peter C. Zanetti.
Vendor Type: Private sector firm.
Material Type: Books, educational equipment, publications.
Subjects: Heating, air conditioning, refrigeration, mechanics.
Description: Instructional systems for training in heating, refrigeration and air conditioning.

Tektronix, Inc. *[192]*
Tektronix Industrial Park, PO Box 500, Beaverton, OR 97077
Phone: (503) 627-7111
Vendor Type: Private sector firm.
Material Type: Learning modules, educational equipment, instructional materials.
Subjects: Electronics.
Description: Electronic lab training materials and equipment.

Tele-A-Train, Incorporated *[193]*
PO Box 4752, 309 North Market Street, Chattanooga, TN 37405

BEST COPY AVAILABLE

Phone: (615) 624-2628
Vendor Type: Private sector firm.
Material Type: Videotape cassettes, films, nonprint media.
Subjects: Mechanics, electricity, electronics, welding.
Description: High quality technical training and safety videotapes and films on hydraulics, pneumatics, electrical, electronics, SCR motor control and welding.

Telemarketing Institute, Inc. *[194]*

1820 S. Cleveland, Sioux Falls, SD 57103
Phone: (605) 335-3970
Contact: Mary Pekas.
Vendor Type: Private sector firm.
Material Type: Books, professional services, educational services, publications.
Subjects: Telemarketing.
Description: Publications, consultant services, training and equipment for all aspects of telemarketing.

3M Electronic Specialty Products *[195]*

9325 Progress Parkway, PO Box 540, Mentor, OH 44061-0540
Phone: (216) 354-2101; (800) 321-9668
Contact: Tammy C. Zucker.
Vendor Type: Private sector firm.
Material Type: Educational equipment.
Subjects: Electronics.
Description: Anti-static devices, electronic prototype and test devices.

Time Motion Tools *[196]*

410 South Douglas Street, El Segundo, CA 90245
Phone: (213) 772-8170 x810
Vendor Type: Private sector firm.
Material Type: Educational equipment.
Subjects: Electronics.
Description: Test equipment, production aids, telecommunications equipment, maintenance and repair tools, took kits, workstations, and static control products.

TPC Training Systems *[197]*

1301 South Grove Street, PO Box 1030, Barrington, IL 60010
Vendor Type: Private sector firm.
Material Type: Instructional materials, educational media.
Subjects: Electricity, wastewater, robotics, mechanics, electronics, air conditioning, refrigeration, machine shop.
Description: Published the Catalog of Technical Skills Training Programs. Includes instructional materials for complete training programs in power plant operation, electrical systems, machine shop operation, air conditioning and refrigeration systems, industrial electronics, instrumentation and process control, mechanical systems, industrial pollution, maintenance, water/wastewater treatment and robotics.

United Industries, Inc. *[198]*

1200 Belle Avenue, Winter Springs, FL 32708
Phone: (407) 699-9152
Contact: Dennis Kelly.
Vendor Type: Private sector firm.
Material Type: Educational equipment.
Subjects: Trade and industrial education, vocational education.
Description: Pads, portfolios, attaches and sport bags.

Versacad Corporation *[199]*

2124 Main, Huntington Beach, CA 92648
Phone: (714) 960-7720
Contact: Jeffrey Hovey.
Vendor Type: Private sector firm.
Material Type: Courseware, computer software.
Subjects: Drafting.
Description: Computer software program for computer assisted drafting.

Vibration Technology Company *[200]*

Box 481, Reedsport, OR 97467
Phone: (503) 271-4542
Vendor Type: Private sector firm.
Material Type: Educational equipment.
Subjects: Mechanics, manufacturing.
Description: A supplier of machinery alignment and balance computers.

Video Training Resource, Inc. *[201]*

7500 W. 78th Street, Edina, MN 55435-2889
Phone: (800) 828-8190
Vendor Type: Private sector firm.
Material Type: Videotape cassettes.
Subjects: Electronics, machine shop, welding, hydraulics, safety, plant maintenance.
Description: Videotape series in the area of electronics, machine technology, welding, hydraulics, plant maintenance and industrial safety. Materials are competency based.

Visual Systems Company, Inc. *[202]*

1596 Rockville Pike, Rockville, MD 20852
Phone: (301) 770-0500
Vendor Type: Private sector firm.
Material Type: Educational equipment.
Subjects: Drafting, graphics.
Description: Instructional equipment and supplies for drafting and graphics.

Vocational and Career Assessment *[203]*

11934 Triple Lane, PO Box 1566, Lakeside, CA 92040

Phone: (619) 561-2092
Contact: Joyce Ercoli.
Vendor Type: Private sector firm.
Material Type: Books, publications.
Subjects: Trade and industrial education, career education.
Description: Materials for assessment of vocational interests, aptitudes and abilities.

Vocational Industrial Clubs of America *[204]*

PO Box 3000, Leesburg, VA 22075
Phone: (703) 777-8810
Contact: Thomas W. Holdsworth.
Vendor Type: Network.
Material Type: Books, audiovisual aids, publications, educational media.
Subjects: Trade and industrial education.
Description: Publications and audiovisuals for trades represented in VICA organization.

Vocational Marketing Service *[205]*

18510 Carpenter Street, Homewood, IL 60430-3534
Phone: (312) 799-6560
Contact: Mike Walsh.
Vendor Type: Private sector firm.
Material Type: Books, videotape cassettes, publications.
Subjects: Heating, ventilation, air conditioning, construction.
Description: Publications for HVAC and a videotape on construction.

Vocational Media Associates, Prentice-Hall Media *[206]*

Box 1050, Mount Kisco, NY 10549
Phone: (800) 431-2266
Contact: Linda Morgan.
Vendor Type: Private sector firm.
Material Type: Videotape cassettes, filmstrips, slides, nonprint media, transparencies.
Subjects: Trade and industrial education, vocational education.
Description: Videos, filmstrips and slides in over 500 programs in 16 vocational areas.

Vocational Studies Center, University of Wisconsin-Madison *[207]*

1025 West Johnson Street, Madison, WI 53706
Phone: (608) 263-4357
Contact: Merle Strong.
Vendor Type: Network.
Material Type: Audiovisual aids, books, courseware, educational media, publications, computer software.
Subjects: Trade and industrial education, vocational education.
Description: Audiovisuals, publications and software for vocational education.

Vocational Technical Education Consortium of States *[208]*

795 Peachtree Street, NE, Atlanta, GA 30365
Phone: (404) 897-6158
Contact: Ron McCage.
Vendor Type: Network.
Material Type: Instructional materials, curriculum guides, educational media.
Subjects: Trade and industrial education, vocational education.
Description: Compentency based materials that include catalogs of performance objectives and performance guides, V-TECs, curriculum guides, criterion referenced test items, occupational data analysis system, workshops, seminars and technical assistance. V-TECH materials can be ordered through the Curriculum Publications Clearinghouse, Western Illinois University, Hovalin Hall 46, Macomb, IL 61455.

Western Curriculum Coordination Center *[209]*

College of Education, West 216, University of Hawaii, 1776 University Avenue, Honolulu, HI 96822
Phone: (808) 948-7834
Contact: Lawrence F.H. Zane.
Vendor Type: Network.
Material Type: Instructional materials, books, educational media, publications.
Subjects: Trade and industrial education, vocational education.
Description: One of six centers in the national network for curriculum coordination. Publications available on a loan basis. Serves American Somoa, Arizona, California, Guam, Hawaii, Nevada, Northern Marianas, and Turst Territory.

The Wisconsin Foundation For Vocational, Technical and Adult Education, Inc. *[210]*

2564 Branch Street, Middleton, WI 53562
Phone: (608) 831-6313
Contact: Mark Marlaine.
Vendor Type: Network.
Material Type: Courseware, computer software.
Subjects: Electronics.
Description: Linear and interactive video coursework for electronics instruction.

Womens Educational Equity Act Publishing Center, Inc. *[211]*

55 Chapel Hill, Newton, MA 02160

BEST COPY AVAILABLE

Phone: (617) 969-7100
Vendor Type: Private sector firm.
Material Type: Books, audiovisual aids, films, videotape cassettes, publications, educational media, mass media.
Subjects: Trade and industrial education, educational equity.
Description: Instructional materials for helping women achieve educational equity. Print and audiovisual materials available at cost. Films and videotapes on a rental basis.

WordPerfect Corporation *[212]*

1555 North Technology Way, Orem, UT, 84057
Phone: (801) 227-4020
Contact: Mary Hunn.
Vendor Type: Private sector firm.
Material Type: Books, courseware, instructional materials, publications, computer software, educational media.
Subjects: Trade and industrial education, vocational education.
Description: Software and manuals for word processing system.

22 June 1989

MEMORANDUM

TO: Carl

FROM: Karen KS

RE: Vocational Education Curriculum Materials (VECM) subfile

I have finished reformatting the VECM subfile of the apprenticeship clearinghouse curriculum database.

The load subdirectory of the DOS partition on the FIPSE computer contains loadable files labelled VECM1A and VECM2A. The loadable files do not contain abstracts. Doing a load of the records using the abstracts that came with the original records is pushing copyright. The FIPSE floppy disk container contains backup disks with the loadable VECM1A/2A files on them. VECM1A AND VECM2A are stored on the FIPSE computer in the directory VECMBACK for archival purposes.

In addition, the container contains backup disks of the VECM files with the abstract/descriptive note field that have been left with the edited records. These files are labelled VECM1 and VECM2. The files are stored on the FIPSE computer in the directory called VECMBACK. Should you decide to reload your database in the future with edited abstracts (edited to avoid copyright violation) you will have the part of the file already in the clearinghouse database plus the part with the abstracts. You will not need to rekeyboard the note/abstract field, but rather edit it using a word processor. Then you can simply reload the file. My experience working with these files suggests that using a standard word processor, saving the file as an ascii file and reloading it will save a lot of headaches in the long run given the staff available to support the project.

The VECM1 and VECM1A files are stored on their respective floppy disks using the DOS command "backup." When you are ready to use them, they need to be restored to the hard disk at the root directory and then copied to the appropriate word processing subdirectory. The files are large enough that the only way to store them on a floppy disk was to do backup, particularly since I do not have access to high density disks. High density disks could be used from the top floppy disk drive on the FIPSE computer and will contain twice the information that a standard disk contains.

An original intent of this project was to use the BRS software on the FIPSE computer to build subfiles based on subject content. These files could be downloaded and reformatted in WordPerfect to publish as part of the paper directory. Rather than wait for the files to be loaded into the BRS software to do this sort, I would recommend that you start a word processor/typist with the files on the disks that include WordPerfect on the label. These disks were backed up using the DOS command backup and need to be restore to the root directory (see discussion above).

The WordPerfect disks have a stack of paper accompanying them. Someone will need to sort the records by subject subdivision and build subfiles that can be inserted in the directory. As you can see from the paper copy, each record has a DE field (descriptor field). The appropriate descriptor can be highlighted for the appropriate subdivision in your printed directory. According to the WordPerfect manual, WordPerfect has a scrapboard that someone could save records to, depending on the highlighted descriptor. Then someone will have to determine which fields in the records should be saved and reformatted for publication purposes once the subject sections for your printed directory are built. The paper copy provided with the floppy disks for use with WordPerfect is yours to mark up anyway that you choose.

How you decide to build your printed directory is up to you. As I mentioned above, I would recommend that you do not wait until the files are loaded on the FIPSE computer in the BRS Search Software. The issues involved in loading the files are addressed in a separate memo. The VECM file is one of four you will need to process for your printed directory. There are about 10,000 to 15,000 lines in the VECM file. The file started out at about 30,000 lines. Four passes and 60-70 hours later on the computer, the file is finished as far as I am concerned. (The 60-70 hours excludes the time Burr spent on the original file picking out the records he felt should be included in the database.)

I need to move on to the other subfiles (NTIS, RIVE, and ERIC) and finish them. A third of the NTIS file is finished and the RIVE file is nearly finished. My intent is to bring each of the four subfiles to a finishing point regarding my involvement with them and then move to the next one...just as I did with the vendor directory. You will need to have someone else do the word processing that I did on the vendor directory. If you have questions about VECM, I will be glad to try to answer them. You know where to find me.

cc: Courtney, Fancher

29 June 1989

MEMORANDUM

TO: Carl

FROM: Karen

RE: Rive subfile

The attached material is from the Rive subfile of the clearinghouse database. A loadable copy of the file is in the Load directory on the DOS partition of the FIPSE computer. Backup copies are stored in the RIVEBACK subdirectory in the DOS partition on the FIPSE computer and in the floppy disk container. The disk that accompanies this memo along with the paper copy is for the person who is doing the word processing for the printer version of your directory.

29 June 1989

MEMORANDUM

TO: Carl

FROM: Karen

RE: NTIS subfile

The attached material is from first part of three parts of the NTIS subfile of the clearinghouse database. A loadable copy of the file is in the Load directory on the DOS partition of the FIPSE computer. Backup copies are stored in the NTISBACK subdirectory in the DOS partition on the FIPSE computer and in the floppy disk container. The disk that accompanies this memo along with the paper copy is for the person who is doing the word processing for the printer version of your directory.

4 July 1989

MEMORANDUM

TO: Carl Horstrup

FROM: Karen Starr Karen Starr

RE: Apprenticeship Clearinghouse

Earlier I indicated that I would be putting together some comments about the directory of apprenticeship information that we have been working on for the past two years. The following will point:

1. out how the apprenticeship database fits in the bigger information picture;
2. what needs to be done in order to build a small scale database;
3. what we have done;
4. what is currently in process;
5. what still needs to be done;
6. how all that fits the requirements of the community college network.

Information about apprenticeship comes in many forms and can be found in many places. In the last 20 years, the amount of information available for use has proliferated regardless of the discipline under consideration. Practitioners and researchers find it difficult at best to locate what they need. Knowing a few pertinent journals and where some documents are located no longer is sufficient to find the information that may be appropriate to answer a research need.

Indexes, as they are known in the information discipline, provide a bibliographical analysis of groups of publications. They are usually published on a regular basis. Their development originally occurred in order to provide some kind of control over the proliferation of information and to provide multiple access points to a wide variety of published and unpublished information. When the publishing industry switched from producing indexes on paper to producing them on computers, people began to use the term database instead of index. There are many kinds of databases. Indexes are only one of them. The intent of the clearinghouse is to produce an index for the apprenticeship literature.

The apprenticeship field is no different than any other. A person might use books, journal articles, microcomputer software, curriculum materials, teaching aids, evaluation instruments, and technical reports, among others. Finding these sources requires an understanding of who developed them originally, how they have been identified and indexed by the information industry, and where they are located.

As an information speciality, apprenticeship has traditionally been ignored by the indexing houses. If you want to know what has been published on apprenticeship, then you need to know what index to look in for what kind of information or information format. The apprenticeship clearinghouse draws that information together in one place. Instead of having to go to several sources, a practitioner only has to go to one.

Developing an apprenticeship database requires several steps. These include the following:

* Deciding exactly what scope of the subject needs to be included. Is it vocational education material, or apprenticeship material? What types of apprenticeship programs need to be included? Should there be general information about education or more specialized information?

* When the coverage has been determined, then the vocabulary required to describe the subject area/s needs to be developed. If there is one way to say something, there is usually a number of ways.

* A decision needs to be made about what sources of apprenticeship information will be used. Will it just be from the ERIC system? What other indexes or sources of information are out there? How comprehensive should the coverage be? Will this information be collected using state-of-the-art technology? How much hand searching will be done to be comprehensive since there are many sources of information that still cannot be accessed using computers?

* Before looking in the available indexes, the vocabulary built above needs to be compared to the vocabulary used to build the index being searched. How the National Technical Information Service indexes information will be different from how the ERIC clearinghouse systems works. In order to retrieve information the person doing the retrieving needs to be using the some vocabulary as the system being queried. Otherwise the results may be zero even though there is plenty of material available in the index.

* This vocabulary must be put into a format required by the computer software used to search for apprenticeship information; i.e. BRS Information Technologies (see attached search strategy).

* Given the apparent framework of the clearinghouse, the decision was made to use indexes that were available in computer format. The resulting bibliography could be saved on a microcomputer, edited, reformatted and loaded into the database management software for the clearinghouse. We reviewed the indexes available in computer format on BRS Information Technologies and Dialog Information Services. There were seven indexes that were prime candidates for containing apprenticeship information (see attached listing). Of those seven, four did not have copyright restrictions (see attached copyright information). These included ERIC, NTIS, Vocational Education Curriculum Materials, and Resources in Vocational Education (see attached descriptions). The decision was made to use these indexes as the core source of apprenticeship information for the clearinghouse.

* Information in database form is often copyrighted. The citations being included in the apprenticeship clearinghouse are not officially copyrighted by the database producers; i.e., disclaimers are not included in the database policies as published by the information vendors (see attached). Mention was made of this earlier in the project and copies of the attached policy statements were made available. If during the interim those copies have disappeared, I would strongly encourage the copyright policy statements be looked at again. I would like to also suggest consideration be given to the idea of seeking some formal acknowledgement of how non-copyrighted information being used in the clearinghouse would impact the clearinghouse legally. Those are questions I cannot answer.

* The search strategy was executed in four databases on the BRS Information Technologies mainframe computer in Latham, New York. The ERIC search was printed offline and edited by a panel. The accession numbers from those selected to be included in the database were sent back into the ERIC database on BRS/After Dark and downloaded. The rest of the databases were searched on BRS/After Dark and results captured electronically the first time. All four databases produced about 1.5 megabytes of information per database. This took about 4 to 5 hours per database to download at 1200 baud transmission speed on the computer in New York; i.e., about 20 hours of straight downloading time from New York.

* These files were printed on paper and given to Burr Fancher to edit. The records he chose to include in the apprenticeship database usually included 50 to 75% of each of the original files.

* I took the edited paper version of each downloaded file, went back into the electronic version of the file, and erased the records that were not selected. Each file came from a different database on the BRS Information Technologies mainframe computer in New York. Each of these files looked different. I analyzed the fields that were held in common and created a standard set of fields to be included in the apprenticeship database (see attached). This meant that I had to go through each file line by line and erase all the information that would not be part of the apprenticeship database. Then I had to rename the fields so they would be consistent. Each file had a different order of fields based on the original producers decisions about record structure. Line by line, I went through each file and reordered the fields so they would be consistent across all four files. There are a total of 2,647 records that require this attention. When these files are read into the apprenticeship database the computer will be looking for absolute consistency. Then I went through and erased the abstracts, as part of the copyright issue, to create the final loadable file. Each file took 60 to 70 hours of editing time.

* As each of these files have been finished they were loaded on the FIPSE computer in a directory called LOADAPPR for the apprenticehsip database. Archival copies of the files were loaded into the following directories: RIVEBACK, ERICBACK, VECMBACK, and NTISBACK. These archival copies include a copy of the loadable file, a copy of the loadable file with abstracts, and a copy of the original downloaded file. There are also archival copies of these files in the FIPSE floppy disk holder.

- The project also included a directory of vendors who produce apprenticeship materials. I keyboarded the directory, reformatted it in Microsoft Word as a printable directory, and loaded a file in the directory LOADVEND for a vendor database on the FIPSE computer. Archival copies were loaded in the VENDBACK directory and put in the FIPSE floppy disk holder.

- An additional disk of each file was made available for word processing purposes following completion of the file. I recommend that these files be prepared for the paper directory now, rather than waiting for the databases to be loaded on the FIPSE computer.

The amount of time required to prepare the files for the FIPSE database has been enormous considering that I hold a full time job and can only work on this project at night, on weekends, and during my vacation time. In one of my original memos to you, I pointed at the kind of personnel a project like this needs in order to succeed (see attached). The original project was suppose to be mounted on a mainframe computer with support from either LCC or others. When that support appeared to not be forthcoming the project was scaled down to a microcomputer. Given the nature of the project, the software selected to handle the database was a reasonable compromise. It can offer remote access. It has an accounting system built into the software to track users. The software uses an interface that is currently standard in the online information field.

Burr and I have been able to satisfy the needs of two thirds of the project. Together we bring editing, indexing, online searching, and database design skills. Neither one of us has the time or the skills to handle being a systems specialist. If this were a full time position, I would love to take it on. I have to be realistic about what I can do in the time I have available. Serving as a systems specialist simply is not a practical position for me to be in at this point in time.

In order to finish off the project, it is important that you find someone in the Eugene area that understands the Unix operating system, understands databases, and can load the prepared files for you. The process is not that difficult. There are oh so many things that can go wrong during that process. A person who has the systems background can deal with the problems in a much shorter time span that either Lynn or I can. That person would also be available to assist you in a more timely manner than either Lynn or I are able to given that we already have full time employment.

I would be more than happy to work with a systems person to bring them up to speed on what has been finished on the project. I can also work with Burr to write user documentation for the databases. Again, I will be unable to do the systems work.

This leads me to the telephone call I made to Washington D.C. The idea of making the files available to the system this group is responsible for is a nice one. Unfortunately they expect you to put those files in some sort of order that would fit their needs. If that you means me, no thanks. I agreed to put the files in a readable order for the FIPSE software on the computer in your office. I no longer have the time to spend reformatting them to satisfy someone else's needs. I did not pursue the telephone conversation because I wanted to finish this memo and attached information, and because I still have files to edit.

I am leaving for an appointment in Oslo, Norway, on September 6 that will last until June 30, 1990. It is with the Norwegian School for Library and Information Science and involves working with Norwegian librarians who are interested in American information systems. It also includes working with the Nordic Council for Scientific and Technical Information in Helsinki, Copenhagen, Stockholm, and Reykjavik. The project is being funded by the American Library Association and the US Information Service. It is an opportunity I cannot afford to pass up. I will be on leave without pay from Oregon State University and have a job at the OSU Library when I return to the US.

I feel very strongly that you need to have a systems person accessible to you with more time than either Lynn or I have if you intend to make the database go the way *it has the potential to go.* I would appreciate it if you would please think about the comments I have outlined above and read through the attached information. If you want to talk about the project and its needs I would be more than happy to meet with you in Eugene the next time I bring a finished file down. That should be relatively soon since currently I am winding up the NTIS file. I will have the ERIC file finished by the end of July.

cc: Courtney, Fancher

construction or bricklayer$1 or carpenter$1 or cabinetmaker$1 or cement adj mason$1 or concrete adj finisher$1 or construction adj laborer$1 or drywall or glazier$1
ironworker$1 or millman$1 or molder$1 or painter$1 or plasterer$1 or roofer$1 or tilesetter$1
1 or 2
culinary or baker$1 or cook$1 or meatcutter$1
electrician$1 or electronic$1 or instrument adj mechanic or limited adj energy adj technician$1 or line adj installer$1 or line with repairer$1
manufacturing adj plant adj electrician$1 or radio adj repair adj mechanic$1
5 or 6
graphic$1 or bookbinder$1 or letterpress adj operator$1 or offset adj press adj operator$1 or photo adj engraver$1 or photolithographer$1 or printer$1
sign adj maker$1 or stained adj glass adj artist$1 or web adj pressman
8 or 9
operating adj engineer$1 or rock adj crushing adj plant adj operator$1
autobody with mechanic$1 or fender adj mechanic$1 or auto adj mechanic$1 or diesel with mechanic$1 or farm with mechanic$1 or gunsmith or heavy adj equipment adj mechanic$1
locksmith$1 or maintenance adj mechanic$1 or millwright$1 or parts adj counterman or power adj saw adj mechanic$1 or small adj engine adj mechanic$1 or tractor adj mechanic$1
12 or 13
dental adj technician$1 or fire adj medic$1 or inhalation adj therapist$1 or optical adj technician$1
diemaker$1 or blacksmith$1 or machinist$1 or patternmaker$1 or sheet adj metal or welder$1
boilermaker$1 or pipefitter$1 or plumber$1 or stationary adj engineer$1 or steamfitter$1 or turbine adj operator$1
jeweler$1 or shoe adj repairer$1 or upholsterer$1 or firefighter$1 or police adj officer$1 or shoe adj maker$1 or furrier$1 or dressmaker$1 or textile$1
apprentice$6
on with job adj training or experiential adj training or field adj experience adj program$1 or inplant adj program$1 or industrial adj training or work adj experience adj program$1
curriculum adj guide$1 or curriculum adj material$1 or course adj content or instructional adj material$1 or curriculum adj content or core adj curriculum
secondary adj school adj curriculum or pretechnology adj program$1 or learning adj module$1 or instructional adj film$1 or study adj guide$1
teacher adj development adj material$1 or audiovisual adj aid$1 or chart$1 or diagram$1 or illustration$1 or teaching adj guide$1 or test$1
21 or 22 or 23
vocational adj education or vocational adj training or business adj education or cooperative adj education or distributive adj education or occupational adj home adj economic$1
technical adj education or trade with education or allied adj health adj occupation$2 adj education or agricultural adj education or industrial adj education or job adj skill$1
job adj training or vocational adj rehabilitation or vocation$2 with agriculture
25 or 26 or 27
universit$3 or secondary adj school$1 or secondary adj education or technical adj institute$1 or high-school or high-schools or junior adj college$1 or community adj college$1
adult adj education or postsecondary adj education or college$1
29 or 30
3 and 19
(4 and 19) not 32
(7 and 19) not (32 or 33)
(10 and 19) not (32 or 33 or 34)
(11 and 19) not (32 or 33 or 34 or 35)
(14 and 19) not (32 or 33 or 34 or 35 or 36)
(15 and 19) not (32 or 33 or 34 or 35 or 36 or 37)
(16 and 19) not (32 or 33 or 34 or 35 or 36 or 37 or 38)
(17 and 19) not (32 or 33 or 34 or 35 or 36 or 37 or 38 or 39)
(18 and 19) not (32 or 33 or 34 or 35 or 36 or 37 or 38 or 39 or 40)
32 or 33 or 34 or 35 or 36 or 37 or 38 or 39 or 40 or 41
(3 and 20) not 42
(4 and 20) not (42 or 43)

(7 and 20) not (42 or 43 or 44)
(10 and 20) not (42 or 43 or 44 or 45)
(11 and 20) not (42 or 43 or 44 or 45 or 46)
(14 and 20) not (42 or 43 or 44 or 45 or 46 or 47)
(15 and 20) not (42 or 43 or 44 or 45 or 46 or 47 or 48)
(16 and 20) not (42 or 43 or 44 or 45 or 46 or 47 or 48 or 49)
(17 and 20) not (42 or 43 or 44 or 45 or 46 or 47 or 48 or 49 or 50)
(18 and 20) not (42 or 43 or 44 or 45 or 46 or 47 or 48 or 49 or 50 or 51)
43 or 44 or 45 or 46 or 47 or 48 or 49 or 50 or 51 or 52
(3 and 24) not (42 or 53)
(4 and 24) not (42 or 53 or 54)
(7 and 24) not (42 or 53 or 54 or 55)
(10 and 24) not (42 or 53 or 54 or 55 or 56)
(11 and 24) not (42 or 53 or 54 or 55 or 56 or 57)
(14 and 24) not (42 or 53 or 54 or 55 or 56 or 57 or 58)
(15 and 24) not (42 or 53 or 54 or 55 or 56 or 57 or 58 or 59)
(16 and 24) not (42 or 53 or 54 or 55 or 56 or 57 or 58 or 59 or 60)
(17 and 24) not (42 or 53 or 54 or 55 or 56 or 57 or 58 or 59 or 60 or 61)
(18 and 24) not (42 or 53 or 54 or 55 or 56 or 57 or 58 or 59 or 60 or 61 or 62)
54 or 55 or 56 or 57 or 58 or 59 or 60 or 61 or 62 or 63
(3 and 28) not (42 or 53 or 64)
(4 and 28) not (42 or 53 or 64 or 65)
(7 and 28) not (42 or 53 or 64 or 65 or 66)
(10 and 28) not (42 or 53 or 64 or 65 or 66 or 67)
(11 and 28) not (42 or 53 or 64 or 65 or 66 or 67 or 68)
(14 and 28) not (42 or 53 or 64 or 65 or 66 or 67 or 68 or 69)
(15 and 28) not (42 or 53 or 64 or 65 or 66 or 67 or 68 or 69 or 70)
(16 and 28) not (42 or 53 or 64 or 65 or 66 or 67 or 68 or 69 or 70 or 71)
(17 and 28) not (42 or 53 or 64 or 65 or 66 or 67 or 68 or 69 or 70 or 71 or 72)
(18 and 28) not (42 or 53 or 64 or 65 or 66 or 67 or 68 or 69 or 70 or 71 or 72 or 73)
65 or 66 or 67 or 68 or 69 or 70 or 71 or 72 or 73 or 74
(28 and 19) not (42 or 53 or 64 or 75)
(28 and 20) not (42 or 53 or 64 or 75 or 76)
(28 and 24 and 31) not (42 or 53 or 64 or 75 or 76 or 77)